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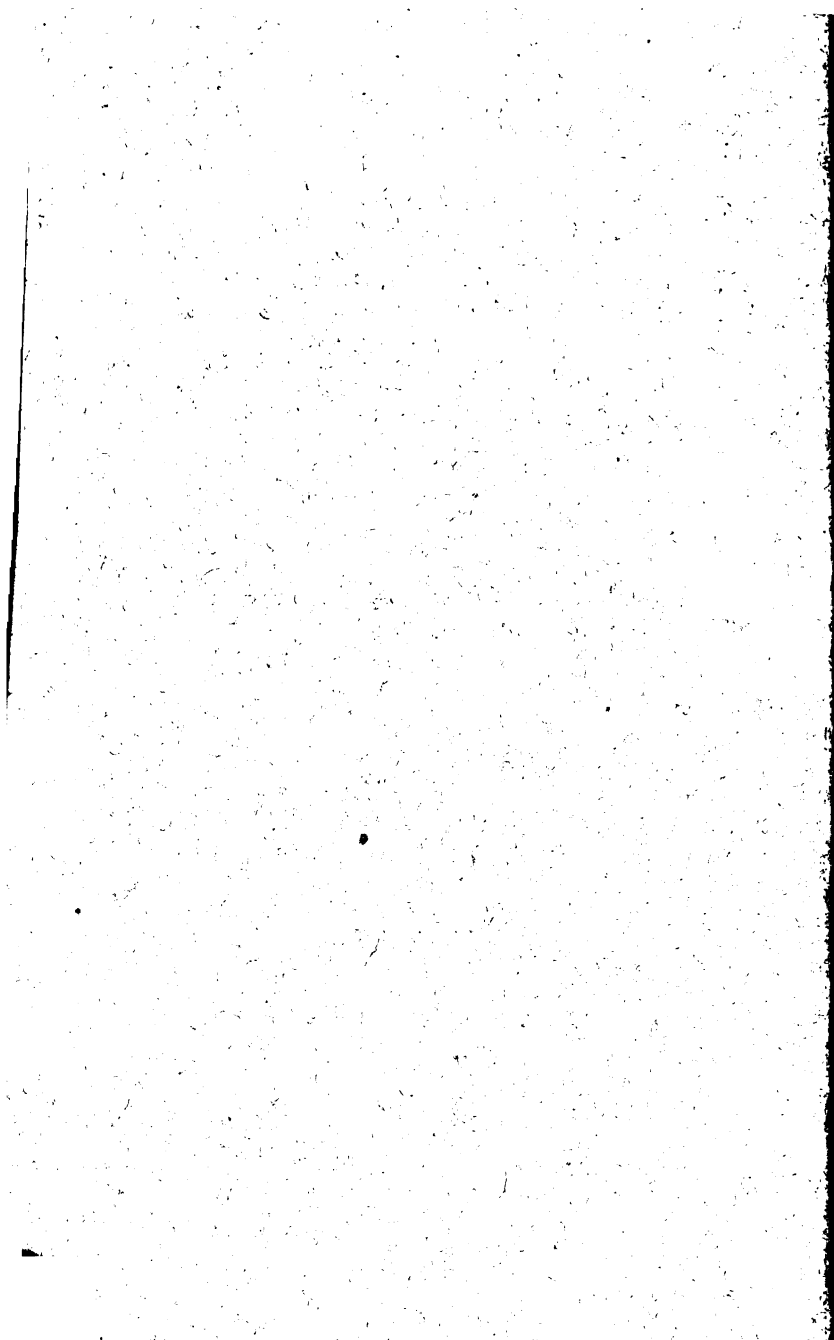
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OFFICIAL GUIDE
TO
THE KEW MUSEUMS.

A HANDBOOK
TO THE
MUSEUMS OF ECONOMIC BOTANY
OF THE
ROYAL GARDENS, KEW.

BY
DANIEL OLIVER, F.R.S., F.L.S.,

CHIEF OF THE HERBARIUM OF THE ROYAL GARDENS, AND SECRETARY
OF HERIOTS COLLEGE, EDINBURGH, LONDON.

SIXTH EDITION.

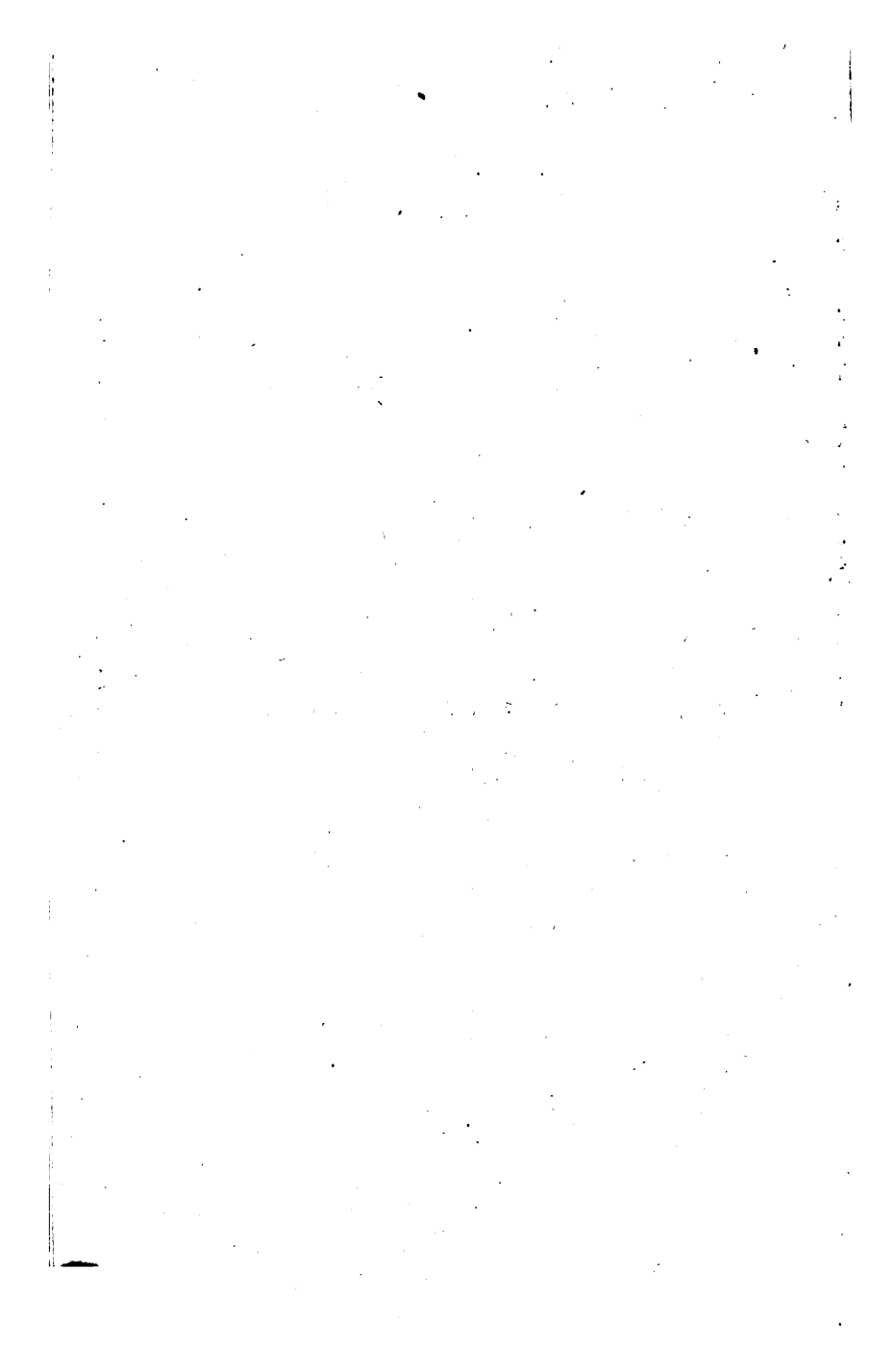
WITH ADDITIONS.

BY JOHN B. JACKSON, A.P., CURATOR OF THE MUSEUM.



PUBLISHED FOR THE ROYAL GARDENS BY JOHN B. JACKSON, MUSEUM, KEW,
1876.

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GUIDE

TO THE

MUSEUMS OF ECONOMIC BOTANY.

THE collections occupy three distinct buildings within the Royal Botanic Gardens.

MUSEUM NO. I. overlooks the ornamental water, and is directly opposite to the Palm-Stove.

MUSEUM NO. II. is three minutes walk from No. I. Its direction is shown by a finger-post standing by the entrance to the latter.

MUSEUM NO. III., devoted chiefly to specimens of Timber and large articles unsuited for exhibition in the cabinets of the other Museums, occupies the building formerly known as the "Orangery," at the north extremity of the Broad Walk, leading to the Ornamental Water and Palm-Stove.

THE OBJECT OF THE MUSEUMS

is to show the practical applications of Botanical Science.

They teach us to appreciate the general relations of the Vegetable World to man. We learn from them the sources of the innumerable products furnished by the Vegetable Kingdom for our use and convenience, whether as articles of food, of construction and application in the arts, of medicine, or curiosity. They suggest new channels for our industry; they show us the variety in form and structure presented by plants, and are a means of direct instruction in most important branches of useful knowledge. We see from them the particular points upon which further information is needed, especially as to the origin of some valuable timbers, fibres, and drugs, in order to perfect our knowledge of economic botany: in brief, the Museums show us *how little* as well as *how much*, we know of the extent to which herbs, shrubs, and trees, contribute to our necessities, comforts, and numberless requirements.

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ORIGIN OF THE MUSEUMS.

The foundation and progress of these unrivalled collections, not only by far the most extensive in existence, but the first of their kind established, may be briefly traced through the few years which have elapsed since the conception of their plan by the late Director of the Royal Gardens, Sir W. J. Hooker.

In 1847 the building now occupied by Museum No. II., which up to that year had been in use as a fruit store-house, etc., was added, by command of Her Majesty, to the Botanic Garden proper. Permission was immediately sought by the Director to have one room of this building fitted up with suitable cases for the exhibition of vegetable products,—objects which neither the living plants of the Garden, nor the preserved specimens of the Herbarium could show. Sir W. J. Hooker's request was liberally met by the Chief Commissioner of Her Majesty's Woods and Forests, and the Museum was forthwith commenced; its nucleus consisting of the Director's private collection, presented by himself.

No sooner was the establishment and aim of the Museum generally made known, than contributions to it poured in from all quarters of the globe, until, in a few years, the ten rooms of the building, with its passages and corners, were absolutely crammed with specimens. Application was therefore made to Parliament by the Chief Commissioner, for a grant to defray the expense of an additional building for the proper accommodation of the objects, and the house occupied by Museum No. I. opened to the public in the spring of 1857, is the result.

From the Exhibitions of 1851 and 1862, and from the Paris Exhibitions of 1855 and 1867, large additions were made to the collections, both by the liberal presentation of specimens (by Messrs. P. Lawson and Son, and others), and also by their purchase, aided by grants from the Treasury and Board of Trade.

The important journey to the Eastern Himalaya and Bengal, by Dr. J. D. Hooker, was a further means of largely increasing these valuable stores. Many eminent firms engaged in the importation and manufacture of vegetable substances, have most liberally contributed various illustrative series. By the different Government Departments—the Admiralty, Board of Trade, etc.,—by our Colonial officers and foreign Representatives, and by numerous private travellers also, the most important services have been rendered and continue to be so.

A large proportion of the contents of the Third Museum has been derived from the several International Exhibitions of London and Paris.

THE ARRANGEMENT OF THE OBJECTS.

The specimens exhibited in Museums No. I. and No. II. are arranged in the order of what is termed the natural affinities of the plants which respectively furnish them. They are grouped under NATURAL ORDERS. The Orders may be compared to families. They are, in some cases, very large, in others comparatively small. Some abound in economic products, while others afford but few.

Between the members of each Order (*Family*) the rule is, that a closer relationship subsists than with the members of any other Order. This relationship or affinity is reckoned by the amount of similarity, chiefly in the form and arrangement, of the parts of the flower and seed; and the correctness of this method is confirmed by a remarkable general, and corresponding uniformity in the character of the products and properties of the plants thus brought together. For example, note the tough, fibrous BARKS of the 'Nettle' Order, the 'Mezereon' Order, the 'Linden' and 'Mallow' Orders;—the BITTER or TONIC properties of the 'Gentian' Order, the 'Quassia' and 'Peruvian Bark' Orders;—the RESINS of the 'Amyris' or 'Frankincense' and the 'Pine' Orders;—the NARCOTIC or POISONOUS character of the 'Nightshade' Order, which includes the Deadly Nightshade, Henbane, and Tobacco; the fruit, too, of the Common Potato, another of its members, is well known to be dangerous.

In dividing the extensive arranged collections between the two museum buildings, advantage has been taken of the two grand classes into which flowering plants are found to be grouped in nature. One of these great classes occupies Museum No. I. The other class, together with all the products, etc., yielded by those plants which are commonly regarded as *not* bearing flowers (as Mosses, Ferns, Seaweeds, Lichens, and Mushrooms), also the miscellaneous articles which do not admit of classification, are contained in Museum No. II.

The same details of arrangement obtain through both Museums. The upright cases are numbered *outside*, above the glass doors: the numbers correspond to those on the margin of this 'Guide.' The botanical and popular name of each Natural Order is exhibited *inside*, at the top of the cabinets; also wherever an Order *begins*, if on a lower shelf. The names of the Orders are also referred to in this 'Guide,' the botanical name being in brackets ().

To simplify and facilitate reference, every object specially enumerated in this book bears, upon a card, mounted *close by* it, a conspicuous corresponding number [26]. One numbering runs through the whole of each Museum.

The proportion of *numbered objects* is very small to the whole; this is a necessity which a handy guide-book, intended for 'visitors' rather than 'students,' imposes. As nearly every object is properly labelled, the deficiency is rather apparent than real. This Guide is not intended to supplant a system of copious instructional labelling, which is being constantly improved upon, and printed labels substituted for those written by hand. Any suggestion bearing upon these, or hints respecting our deficiencies, those who have the charge of this important branch of the Kew establishment will be most happy to receive. Such should be addressed in writing, to the Curator of the Museums, or to the Director of the Gardens. In the method of arranging, mounting, and labelling the specimens, combining scientific accuracy with much useful popular instruction, most important service has been rendered to the Museums by the late Rev. Professor Henslow.

MAPS are placed in the cabinets, showing in red colour the countries furnishing the products near which they are placed. Each map has a full explanation attached to it.

GUIDE TO MUSEUM No. I.

The chief botanical features which characterise the plants represented by their products or other specimens in this House, are these :—1. In their early condition, *while yet enclosed in the seed*, they nearly always have Two (or sometimes more) little, opposite lobes or leaflets (*cotyledons* : hence called *Dicotyledons*). 2. Those which form a woody stem, increase in thickness by a ring of new wood forming year by year on the *outside* of, and continuous with, the old, (hence called *Exogens*, outside growers). 3. The parts of the flowers are most frequently in *fives* or *fours*. 4. The small veins of the leaves are, commonly, *irregularly* netted.

The Collections occupy Three Floors. The numbering begins upon the Top Floor, in the cabinet (No. 1) immediately round the corner to the left, on reaching the head of the stairs, and is continued through the Cases abutting on the back wall of the house to the end of the floor; it then crosses, through the Cases of the end-wall to the front set of cabinets, through

which it continues to the opposite end of the floor, where again it crosses to the back and returns to the head of the stairs. The collections of the Middle and Bottom Floors follow the same order.

TOP FLOOR.

Ranunculus Order (*Ranunculaceæ*). A family widely spread, especially through cool climates. Very few species have woody stems. Its general properties are acrid and poisonous. The Buttercup and Larkspur are common examples of the Order. 1.

No. 1. BIKH or BISH POISON. From the leaves and roots of two or three species of Monkshood (*Aconitum*), growing in the north of India. Used by the hill-tribes to poison arrows for tiger-shooting, etc.

No. 2. ROOTS of MONKSHOOD and HORSE-RADISH, mounted side by side to show the differences between them. The former (*Aconitum Napellus*, L.) is destitute of the pungent odour of the Horse-radish; it is commonly cultivated in gardens, and is a virulent poison.

No. 3. Inner bark of TRAVELLER'S JOY (*Clematis Vitalba*, L.), used in Switzerland for straining milk and for other domestic purposes. The slender shoots are used in France to bind fagots, and the tender extremities are sometimes pickled.

Observe specimens of wood, etc., belonging to the *Magnolia* Order, remarkable for its fine trees, bearing handsome flowers, natives, mostly, of India and North America.

Custard-Apple Order (*Anonaceæ*). Trees or shrubs, chiefly of tropical countries. The species are aromatic in taste and smell; several afford excellent fruit, as—

No. 4. THE SOUR-SOP (*Anona muricata*, L.).

No. 5. THE SWEET-SOP (*A. squamosa*, L.); and

No. 6. THE CUSTARD-APPLE. (*A. reticulata*, L.). All important and largely cultivated tropical fruits.

No. 7. Wood of *Duguetia*, sp., a South American tree. Said to be one of the LANCEWOODS of coach-makers. CASE 2.

The 'Black Lancewood' of Jamaica is furnished by *Oxandra* (*Bocagea*) *virgata*, Rich.

Moon-seed Order (*Menispermaceæ*). Climbing shrubs, possessing bitter and narcotic properties, especially abundant in the tropics.

Observe the curious arrangement of the wood in cross sections of the stem and root.

CASE No. 8. CALUMBA ROOT (*Jateorhiza Calumbä*, Miers). Imported from Eastern Africa, formerly indirectly through Ceylon, whence the name (from Colombo). A tonic medicine.

No. 9. 'COCCULUS INDICUS' (Fruits of *Anamirta Cocculus*, W. & A.). Native of the East Indies; poisonous; used in taking fish, and the "extract" in adulterating porter.

Barberry Order (*Berberidaceæ*). Shrubs and perennial herbs, inhabiting temperate climates. Many possess acid or astringent properties, as—

No. 10. The preserved fruit of the COMMON BARBERRY (*Berberis vulgaris*, L.). Its wood yields a yellow dye.

Observe the *Side-saddle Order* (*Sarraceniacæ*), chiefly bog-herbs of North America, remarkable from the tubular form of the leaves.

Water-Lily Order (*Nymphæaceæ*). Large-flowered, floating herbs, growing in quiet water in various parts of the globe.

No. 11. Flower and leaf of the VICTORIA WATER-LILY (*Victoria Regia*, Ldl.), a native of Guiana and Brazil. The leaves have been observed in deep water to measure twelve feet across; the expanded flowers are about one foot in diameter. The seeds are eaten by the Indians.

Water-Bean Order (*Nelumbiaceæ*). A very small group, consisting of but two or three beautiful species, closely allied to the Water-lilies, but differing in the structure of their fruit and seed.

No. 12. The LOTUS (*Nelumbium speciosum*, Willd.). Regarded by the early Egyptians, and by the Chinese, Cingalese, and Hindoos of the present day, as an emblem of peculiar sanctity. Observe the seeds imbedded in the dry, top-shaped fruit. These are believed to have been the "Sacred Beans" of Pythagoras. The seeds and stem, which contain much starch, are used as food in India and China.

CASE 3. Poppy Order (*Papaveraceæ*). Principally herbs, abounding in a milky juice, natives of temperate climates, especially of Europe. They are remarkable for their narcotic properties.

No. 13. Heads of the OPIUM POPPY (*Papaver somniferum*, L.), cultivated from remote antiquity for the sake of its well-known dried juice—*Opium*. Asia Minor, Egypt, Persia, and India, yield the principal supply. The milky juice is obtained by scratching or puncturing the poppy-heads, from which it slowly exudes, turning to a brown colour. Its subsequent preparation varies in different countries.

The instruments employed in the Indian opium manufacture

are exhibited in this Case, and are separately marked by small, CASE
 numbered, descriptive labels. The poppy-heads (1) are punc- 3.
 tured by little lancets (2), which are drawn from the bottom to
 the top of the 'heads' (3); the juice is collected in small
 scoops (4), poured into plates or bowls (5, 6), from which part
 of the moisture drains off, and carried to the factory in jars
 (7), where, after sampling by bamboo scoops (8), it is assorted
 and mixed with similar qualities in vats, stirred by rakes (9),
 to ensure uniformity. After sufficient exposure, it is made up
 into cakes covered by petals of the poppy (14, 15), cemented
 together (18), with inferior opium. A chest divided into com-
 partments for the Chinese opium trade is numbered 22. The
 balls of opium (23) are packed in "Poppy-trash" (24).

No. 14. Specimens of OPIUM from Smyrna, Egypt, Persia,
 and India.

Crucifer Order (*Cruciferae*). Nearly all herbaceous; CASE
 abounding in the temperate countries of the northern hemi- 4.
 sphere. They are called *Crucifers* (or cross-bearing), from
 the four flower-leaves (petals) being disposed, more or less
 distinctly, in the form of a cross, as in the Wall-flower, Cab-
 bage, and Cress, familiar examples of the Order. None are
 poisonous, though they generally are a little acrid; they are
 especially anti-scorbutic.

No 15. MUSTARD SEED (*Sinapis alba*, L., and *S. nigra*, L.).
 Various sorts of commerce. 'Mustard,' is prepared by crush-
 ing the seeds and sifting the 'flour.'

No. 16. CABBAGE WALKING-STICKS, the stems of a variety of
 the Garden Cabbage (*Brassica oleracea*, L.), grown in the Chan-
 nel Islands. The growth in height is promoted by constantly
 stripping off the leaves. From the seeds of a variety of the
 Cabbage cultivated on the Continent, the COLZA OIL, used in
 lamps, is expressed

No. 17. The so-called "ROSE OF JERICHO" (*Anastatica
 hierochuntica*, L.), growing in the deserts of Arabia and Egypt.
 The plant is an annual; after withering, its hygrometric stems
 roll themselves up in a ball, are loosened and blown about by
 the wind, expanding again with the first rain-fall.

No. 18. WOAD, a dye yielded by *Isatis tinctoria*, L., said
 to have been used by the ancient Britons, prior to the Roman
 conquest, to stain their skin a blue colour. From the simil-
 arity of the names by which it is known in the languages of
 Northern Europe, its culture for this purpose has probably
 been very general at a remote period.

CASE **Caper Order** (*Capparidaceæ*). Herbs or trees, frequently
 5. spiny, and chiefly inhabiting hot and desert countries. The fruit is often curiously raised upon a distinct stalk, above the scar of the withered flower.

No. 19. CAPERS. The pickled flower-buds of species of *Capparis* growing by the Mediterranean.

Arnatto Order (*Flacourtiaceæ*). Shrubs or trees of the hottest parts of the globe.

Observe the snuff-boxes and ornaments, made of the round fruits of *Oncoba*, by the native tribes about Natal.

No. 20. ARNATTO, used as an orange or yellow dye for silks, and for staining cheese; imported chiefly from South America. It is prepared from the red-coloured pulp which covers the seeds of *Bixa Orellana*, L. Dried specimens of the plant are also here shown, having the red seeds still attached to the inside of the fruit-capsules.

Cistus Order (*Cistaceæ*). A Mediterranean group represented by the 'Rock-roses' and 'Gum Cistus' in our gardens.

No. 21. LABDANUM, a resin exuded by the leaves and branches of *Cistus creticus*, L., and other species of the Levant; formerly, during the prevalence of 'Plague,' largely collected as a medicine, etc., by whipping the plants with long thongs attached to a rake-like frame, the resin adhering to the leathern straps.

Note, in passing, the products of the *Violet Order*, the roots of several species of which possess emetic or purgative qualities,—the *Milkwort Order* characterized by a bitter principle,—and the *Tamarisk Order*.

Chickweed Order (*Caryophyllaceæ*), to which the Pink, Carnation, and Catchfly belong. Nearly all herbs inhabiting cold and temperate climates. Destitute of marked properties, insipidity rather characterizes the Order.

No. 22. Tufts of *Arenaria musciformis*, Wall., and allied species, brought by Drs. Hooker and Thomson from exposed rocks, 14,000 to 18,000 feet above the sea-level, in the Himalaya. Other species grow within the Arctic circle.

CASE **Mallow Order** (*Malvaceæ*). A large family, most
 6. numerous in the tropics, diminishing in number towards the Poles. Remarkably destitute of all noxious properties; mucilaginous, and affording from the inner layers of the bark a useful fibre. The pink Mallows of our roadsides represent the Order in Britain. Observe specimens of the Ochro, the fruit

of *Abelmoschus esculentus*, Med., used in soups, etc., in hot CASE countries. 6.

No. 23. CUBA BAST, the inner bark of *Paritium elatum*, Don, var., used in tying up cigar-bundles. A similar Bast is afforded by a species of *Cavanillesia* in New Carthagena (Order *Bombaceæ*).

No. 24. LAMP OIL, and OIL CAKE for cattle-feeding, from CASE the waste seeds of the cotton-plant. 7.

No. 25. FRUIT of the COTTON-PLANT (*Gossypium herbaceum*, L., *G. barbadense*, L., etc.). Showing 'Cotton' enveloping the seeds in their capsule. Cotton consists of the delicate, tubular, hair-like cells which clothe the seeds; its commercial value depends on the length and tenacity of these hairs.

No. 26. NANKIN COTTON, a naturally coloured variety of the same.

No. 27. A specimen of JAPANESE COTTON, proposed as a substitute for lint.

Case 7 is devoted almost entirely to the different sorts of commercial Cotton, grown in the United States, South America, India, Africa, and the warmer parts of Europe; also specimens of cotton cloths in various stages of manufacture, etc., both by civilized and barbarous nations.

The use of Cotton dates from a very early period. Sanscrit records carry it back at least 2600 years, while in Peruvian sepulchres Cotton cloth and seeds have been found.

No. 28 is a piece of Cotton cloth from a Peruvian mummy.

The import of Raw Cotton into the United Kingdom in 1860 exceeded twelve million cwts.; in 1862, owing to the American War, less than five million cwts. were imported; of these, upwards of three millions and a half were from the British East Indies. In 1874 the total imports were 14,062,075 cwts.

[See in Case 17 specimens of *linen cloth* from the Egyptian tombs.]

Silk Cotton Tree Order (*Bombaceæ*). They are CASE nearly all tropical trees, some of immense size, as the BAOBAB 8. (*Adansonia digitata*, L.), of Western Africa. The bark has been recently introduced for making paper.

No. 29. SILK COTTON surrounding the seeds of *Bombax Ceiba*, L., a South American tree. Used for stuffing cushions, and the like, but not suited to work into cloth-fabrics. Another beautiful 'Silk-cotton' (West Indian), from *Ochroma Lagopus* Sw., is exhibited on an adjoining shelf, with a nest of the 'Doctor Humming-bird' made from it.

No. 30 is a portion of a small stem of the Baobab, together

CASE with fine specimens of the gourd-like fruit, which contains an eatable acid pulp. Stems have been measured thirty feet in diameter. The wood is light, soft, and of little utility.

No. 31. DURIAN FRUIT (*Durio zibethinus*, L.), grown in the Malay Peninsula and Islands. By those who have overcome its civet odour, it is ranked among the most delicious of fruits.

CASE **Sterculia Order** (*Sterculiaceæ*). These resemble in many points of structure, and in their qualities, the Mallow tribe.

No. 32. Flower of the **HAND-PLANT** (*Cheirostemon platanoides*, H. B. K.), venerated by the ancient Mexicans from the singular resemblance to a clawed hand presented by the curved stamens of the flower.

No. 33. 'KOLA NUTS,' the seeds of two African trees, one a species of Cola (*C. acuminata*, R. Br.), the other, Bitter Kola, an undetermined Guttifer, highly valued, especially those of the 'Bitter Kola,' by the tribes on the Niger, for their medicinal properties. About 1000 donkeys, laden with the seeds and fruits, pass through Rabba on the Niger, during the dry season, on their way to the interior. The seed of common Kola is said to possess the virtue of rendering water, becoming putrid, agreeable to the taste.

Chocolate Order (*Byttneriaceæ*). Shrubs or trees resembling the *Sterculias* in many points of structure, and mainly tropical.

No. 34. Fruit of the **CHOCOLATE-TREE** (*Theobroma Cacao*, L.). Grown chiefly in Trinidad, Guiana, and Brazil. The husk contains a number of the seeds, very closely packed in a little pulp. These, after being dried, roasted, and ground, constitute *Cocoa*; if merely broken up after roasting, *Cocoa nibs*; mixed with starch, and very finely ground, *Soluble Cocoa* of the shops. *Chocolate* consists of the same, made up into a paste, and flavoured. An important collection of specimens of *Cocoa* from various countries, with its different preparations by Messrs. Fry, is here exhibited. In 1874, nearly eighteen millions of pounds of *Cocoa* were imported into Great Britain, more than eight millions being entered for home consumption.

Linden Order (*Tiliaceæ*), to which belongs our Lime or Linden tree. As in the case of the last two Orders, without marked properties. The inner bark (*liber*) of some furnishes a very valuable fibre, as—

No. 35. **GUNNY FIBRE** or **JUTE**, obtained from *Corchorus capsularis*, L. Used in making rice and sugar bags in India. It is now an article of large and increasing importation, being used in the manufacture of carpets and other fabrics.

No. 36. BAST from the COMMON LIME (*Tilia europæa*, L.). CASE 9.
Usually prepared in Russia, hence the name "Russia matting." The wood of the Lime, though close-grained, is easily worked, and is pre-eminently a carver's wood. The wood carvings, of Gibbons, executed in the time of Charles II., are in Linden wood.

Malay-Camphor Order (*Dipterocarpaceæ*). A small tribe of gigantic Indian forest trees, characterized by a curious extension of two of the lobes of the calyx into wings, after flowering (see mounted specimens), and by their resinous, balsamic products.

No. 37. Log of SUMATRA CAMPHOR Tree (*Dryobalanops aromatica*, Gært.). The crystallized Camphor is shown *in situ*, upon the wood. It sometimes occurs in masses several pounds in weight. It does not reach Europe, being eagerly bought by the Chinese, in preference to ordinary camphor, their own produce.

Tea Order (*Ternströmiaceæ*). The species, which are all woody, are chiefly South American and Indian. The most important member of the family, the Tea-plant (*Thea chinensis*, L.), is native in Bengal, and probably China, though in the latter country, so famed for its production, it is only known under cultivation. There are three varieties of the shrub, from any of which either 'black' or 'green' teas may be prepared, by peculiar methods of drying; the leaves made up into *green* being more rapidly dried, and not permitted to remain in a moist and flaccid state so long as those intended for *black* tea.

No. 38. A box of ingredients used in the artificial colouring of lower kinds of green tea.

No. 39. BRICK TEA of Tibet, pressed and dried in moulds. It is largely used in Central Asia, boiled with salt, butter, etc. Observe the 'wheatsheaf,' 'lozenge,' 'yellow,' and other sorts of tea.

Upwards of 137,000,000 pounds of tea were entered for home consumption in 1874, the total import exceeding 161,000,000 lbs.

Upon the adjoining wall are hung Chinese drawings, upon rice-paper, representing the history of the Tea-plant, from its first introduction, in fabulous times, to human notice, by a monkey, to the packing and exportation of the present period.

Orange Order (*Aurantiaceæ*). Trees or shrubby plants, most of them bearing smooth and shining leaves, often jointed to the stalk, and minutely dotted with translucent oil-glands. Natives of South-eastern Asia, China, Japan, and the East Indian Islands.

CASE No. 40. BAEI or BELA, of India (*Ægle Marmelos*, Cor.).

9. A delicious fruit. The unripe fruit and bark are used medicinally, as astringents.

No. 41. Preserved fruits of the WAMPÉE, of China and the East Indies (*Cookia punctata*, Retz).

CASE Observe the fruits of different varieties of Orange, Lime, 10. Shaddock or Pompelmousse, Forbidden Fruit, etc., all afforded by trees nearly related to each other, and difficult to distinguish in the absence of fruit. These, and especially the Orange, are cultivated very extensively in warm countries.

No. 42. ORANGES (*Citrus Aurantium*, Riss.) ripened in the open air in Devonshire.

In the island of St. Michael, in the Azores, a single tree has been said to produce 20,000 Oranges fit for exportation. Of Lemons and Oranges, as many as 2,403,338 bushels were imported into the United Kingdom in 1874.

No. 43. FINGERED CITRON, a variety of *Citrus medica*, Riss., having the fruit curiously divided into large finger-like lobes.

Oils of NEROLI and BERGAMOT, highly esteemed as perfumes, are distilled from the flowers and rind of the fruit of species of *Citrus*.

Tutsan Order, or "St. John's-worts" (*Hypericaceæ*). Plants with opposite, undivided leaves, often dotted with minute oil-glands, easily seen when held against the light. They are scattered widely over the globe, although not very numerous, either in species or individuals. A few are used in medicine.

Gamboge Order (*Guttiferae*). A group of trees and shrubs, with entire, opposite, smooth, and rather thick leaves, all natives of tropical countries. Many of the Order afford a yellow, purgative, resinous juice, which in some East Indian species is collected as Gamboge, the well-known valuable pigment and medicine.

No. 44. Bark and young wood of the CEYLON GAMBUGE tree (*Garcinia Morella*, Desv.; *Cambogia*, L.; *Hebradendron*, Grah.); showing the coloured juice which has exuded and dried upon the cut edge. In Ceylon, Gamboge is obtained by incisions in the bark, or by cutting out pieces of it; the juice, oozing from the wounds, hardens on exposure, and is scraped off by collectors.

No. 45. Samples of SIAM GAMBUGE, the produce of *Garcinia Hanburyi*, Hook. fil.

No. 46. The MANGOSTEEN (*Garcinia Mangostana*, L.). Specimens ripened at Sion House, the seat of the Duke of

Northumberland. Said to be the most delicious of tropical CASE fruits. It is a native of Malacca and the East Indies. 10.

No. 47. Fruit of the BUTTER and TALLOW TREE (*Pentadesma butyracea*, Br.), of Sierra Leone. So named from the yellow greasy juice which copiously flows from it when cut. It is mixed by the Negroes with their food.

No. 48. The MAMMEE APPLE (*Mammea americana*, L.), from the West Indies; and

No. 49. *Mammea africana*, Sab. From Sierra Leone and the Niger. Delicious tropical fruits. The gum of the American *Mammee* is used to destroy the 'chigoes' (*Culex penetrans*) in the feet of the Negroes.

No. 50. HOG-GUM, a resin abundantly afforded by *Moro-CASE nobæa coccinea*, Aubl., a fine tree of Jamaica. Chiefly collected 11. by Negroes, who dig it from among the roots of old gum-trees. It is used in medicine, and is inflammable, burning with an agreeable odour.

[The False Hog-gum of Jamaica is yielded by *Rhus Metopium*, L., (*Anacardiaceæ*.)]

Coca Order (*Erythroxylaceæ*). Chiefly West Indian and South American trees or shrubs, some remarkable for the red colour of the wood, hence the name of the Order.

No. 51. A bundle of the dried leaves of the COCA (*Erythroxylon Coca*, Lam.), the narcotic of the Andes and Peru. The Coca-bush is extensively cultivated by the Indians; the annual produce having been estimated at 30,000,000 pounds. The leaves are either infused as tea, or, as is usual, chewed with a little unslaked lime. The immediate effect is a gentle excitement, with sensations of high enjoyment. Its use lessens the desire for food, and enable the chewer to undergo an enormous amount of fatigue, from an increased nervous energy.

Observe the 'popona,' or lime-flask of the Indian coca-chewer, also 'Ipadiú,' the powdered leaf, mixed with a little tapioca, the ashes of Quinoa, *Cecropia*, etc.

['Coca' must be distinguished from 'Cocoa' of the shops, the produce of *Theobroma Cacao*, see Case 9.]

Observe the curious structure of the wood in the stem of one or two of the *Malpighia Order* (*Malpighiaceæ*), a family chiefly tropical South American; often with long twining or pendent stems (*lianes*), bearing opposite leaves, and gaudy flowers with clawed petals.

No. 52. CROSS SECTION of the STEM of an unknown species of *Malpighiaceæ*.

CASE Soapwort Order (*Sapindaceæ*). Chiefly tropical trees and climbers. The fruits of several are edible; others possess a saponaceous principle, and lather freely in water.

No. 53. Fruit of the **AKEE** (*Blighia sapida*, Kg.). A tree of Western Africa. The edible portion is the *aril*, the succulent socket developed round the base of each seed.

No. 54. **GUARANA BREAD** of Brazil, made from the seeds of *Paullinia sorbilis*, Mt. Sold all over Brazil, and used both as food and medicine. For use the rolls are powdered in water, or grated on the '*Piraruca*,' the tongue of a fish (see specimen), and sweetened.

No. 55. **WOOD** of the **HORSE CHESTNUT** (*Æsculus Hippocastanum*, L.). An Asiatic tree, long planted, for shade and ornament, on the Continent and in England. The wood, which is soft, and not durable, is turned to little account. The fruits are used in Switzerland and Turkey for feeding sheep, horses, etc.

No. 56. **LITCHIS** (*Nephelium Litchi*, Don); and

No. 57. **LONGANS** (*Euphoria Longana*, Lam.). Fruits of China and the East Indian Islands, imported in small quantities, dried for dessert.

No. 58. **SOAP-BERRIES**, the seeds of *Sapindus Saponaria*, L., made up into rosaries; formerly worn in England, tipped with gold, etc., as buttons. The seed-vessels are employed in America and the West Indies in washing linen, of which they are said to cleanse more than would sixty times their weight of soap.

No. 59. **TULIP-WOOD** of Australia (*Harpulia pendula*, Planch.)

CASE 12. Maple Order (*Aceraceæ*). Trees principally of temperate Europe, Asia, and America, having opposite and mostly lobed leaves, with the veins radiating from the leaf-stalk. The Sycamore (*Acer Pseudoplatanus*, L.), extensively planted in Britain, is an example of the family.

No. 60. **MAPLE SUGAR** from the United States and Canada. Obtained from the Sugar Maple (*Acer saccharinum*, L.), the sweet sap of which is collected in spring by tapping the tree to the depth of about half an inch with an auger, and inserting a spout. The juice is boiled down to a syrup, clarified, drained, and crystallized. Good Sugar Maples yield each about an average of four pounds of sugar in the season.

The wood of this species sometimes exhibits beautiful 'curled' and spotted markings (Bird's-Eye Maple); such is much valued for inlaying and cabinet-work.

No. 61. Wood of the Maple (*Acer campestre*, L.) and **CASE** Sycamore (*A. Pseudoplatanus*, L.). The white soft wood of 13. the Sycamore was much used before the general introduction of earthenware for making trenchers, bowls, platters, etc.

Under *Rhizobolaceæ*, a small Order of huge South American forest trees, note—

No. 62. **SOUARI NUTS**, the fruits of *Caryocar nuciferum*, L., *C. tomentosum*, Willd., etc. The kernel is said to be the most delicious of the nut kind. It contains an excellent sweet oil, used in South America. The timber of *C. tomentosum* is valuable for ship-building.

Melia Order (*Meliaceæ*). Trees or shrubs, often with pinnated leaves; growing principally in the warmer parts of America and Asia.

No. 63. **CARAPA** or **CRAB OIL**, obtained from the seeds of *Carapa guianensis*, Aub., and used by the natives of British Guiana for burning and also for anointing their bodies.

No. 64. **SATIN WOOD**, afforded by an East Indian tree **CASE** (*Chloroxylon Swietenia*, L.). The wood is durable, close-grained, 14. and will take an excellent polish, preserving a handsome appearance for a long time.

No. 65. **Dye-Wood** of *Flindersia Oxleyana*, Muell. A South Australian tree; with specimens of wool dyed with it, in various shades of yellow-brown.

No. 66. **GUM** of the **WEST INDIAN CEDAR** (*Cedrela odorata*, L.); and

No. 67. **WOOD** of the same.

No. 68. **CEDAR-WOOD** of **NEW SOUTH WALES** (*Cedrela australis*, Br.)

[Although called 'Cedar,' these are totally distinct from the true Cedar (*Cedrus Libani*, Loud.), which belongs to the Pine Order, Case 97.]

No. 69. **Model** of a truck, laden with Mahogany, as employed in bringing the logs to the coast, from the interior of Honduras.

No. 70. **MAHOGANY**, the wood of *Swietenia Mahoganî*, L. A large forest-tree of Central America and Cuba. One of the most valuable of furniture woods. It is stated upon good authority that a single log lies near the south coast of Cuba, too heavy to carry to a port, measuring 9 ft. broad, 6 ft. high, and 12 ft. in length; supposed weight about 18 tons. It has been there about fifteen years, and is likely to remain till it rots. Upwards of 65,000 tons were imported in 1874.

CASE **Vine Order** (*Ampelideæ*), of which the Grape-Vine (*Vitis* 15. *vinifera*, L.), the most important plant of the Order, may be taken as the type. They are all climbing, jointed shrubs, often with abortive flower-branches serving as tendrils to lay hold of their support. None of the Order are native in Europe; they are chiefly East Indian. The Grape-Vine, now cultivated so extensively in France, Germany, South Europe, Atlantic Islands, United States, Cape, etc., was, very probably, native originally of Western Asia, and to the south of the Caspian. From its innumerable varieties, affected by different climates and soils, we have, besides grapes yielding the various wines of commerce, other sorts which are dried, forming the Valentia, Muscatel, and Sultana (without seeds, from Turkey) Raisins; also Currants, the dried fruit of a small-fruited variety of the Grape-Vine (*V. vinifera*, var. *corinthiaca*), cultivated in the Ionian Islands, Greece, Liparis, etc. These are quite distinct from any species of *Ribes*, the Currant of our orchards, to which they are not botanically related.

The products of the grape are mostly unsuited for museum exhibition.

Upwards of 17,000,000 gallons of wine were entered for home consumption in 1874; over 10,000,000 gallons of which were imported from Spain and Portugal.

Of raisins, 382,921 cwts., and of currants, 920,384 cwts., were entered for home consumption in the same year.

No. 71. CREAM OF TARTAR (Bitartrate of Potash), deposited in a crude state, upon the bottom and sides of casks containing fermenting wine.

Cranesbill Order (*Geraniaceæ*). Herbs or shrubs, of which the 'Scarlet Geranium' and the common British 'Cranesbills' may be taken as examples. Scattered very unequally over the globe, though particularly numerous at the Cape of Good Hope. Chiefly remarkable for the beauty of their flowers.

Observe the anomalous structure of the stem in

No. 72. *Sarcocaulon Heritieri*, D.C. (*Monsonia spinosa*, Herit.) It burns like a torch, with a pleasant odour.

Indian Cress Order (*Tropæoleæ*). Smooth trailing or twining herbs, with a pungent taste. The garden Nasturtium (*Tropæolum majus*, L.) and Canary-flower (*T. peregrinum*, Willd.) are familiar examples.

No. 73. Parasol Cover, made of the FIBRE of the GARDEN NASTURTIUM. [*Nasturtium* (Water-cress) belongs to the Crucifer Order.]

Wood-Sorrel Order (*Oxalideæ*). A small family of CASE herbaceous (though sometimes arborescent) plants, frequently 15. with compound leaves, which are sometimes sensitive, abounding in a powerful acidity, due to the presence of oxalic acid. Natives of tropical and temperate countries, Chiefly South America or South Africa.

No. 74. THE BLIMBING (*Averrhoa Bilimbi*, L.), an acid fruit used in the East Indies, often pickled. Notice also the Carambola (*A. Carambola*, L.), likewise eaten in the East Indies.

No. 75. OXALIC ACID, prepared from the Wood-sorrel (*Oxalis Acetosella*, L.).

Flax Order (*Linaceæ*). A small family of plants, chiefly annual, with showy, fugitive flowers, characterized by the tenacious fibre of the inner bark. The most important species is the common Flax (*Linum usitatissimum*, L.), specimens and products of which fill this Case, also Cases 16 and 17.

No. 76. LINSEED, the seeds of the Flax-plant. The husk, or *testa*, of the seed, abounds in mucilage, set free in water. Largely used for the expression of 'Linseed Oil,' the refuse seeds being crushed into

No. 77. OIL-CAKE, for cattle-feeding.

The samples of Linseed are from Russia, Sicily, Egypt, East Indies, and America.

No. 78. British, Dutch, Russian, and other varieties of FLAX as harvested.

No. 79. Same steeped and 'broken,' ready for the operation of 'scutching,' which, whether by hand or machinery, CASE 16. consists in beating and shaking the 'broken' flax, in order to free it from loose and useless particles.

No. 80. HAND HACKLES, of two degrees of fineness. Through the upright pointed wires of the hackling-frame, the stems of flax are drawn to disentangle or comb them out, being freed, at the same time, from remaining extraneous matter. The wire pins are arranged on different frames, in progressive degrees of fineness. The process is now performed by special machinery.

No. 81. FLAX, as imported, of Russian and other growths.

No. 82. Flaxen tarpaulin, for railway use.

No. 83. Linen cloth used to envelope the dead by the CASE ancient Egyptians, among whom Flax was cultivated from 17. remote antiquity. It was grown also by the Jews, who obtained it from Egypt.

The remainder of this case contains numerous specimens of linen cloths, etc., chiefly of Irish manufacture.

CASE In 1874, 2,373,993 cwts. of Flax and Tow, or Codilla of Flax,
 17. were imported into the United Kingdom, upwards of one million being from Russia. Of Linseed, 1,682,875 quarters were imported in the same year.

Pittosporad Order (*Pittosporaceæ*). A small group of woody species, without very salient botanical features, confined to the Old World. They are chiefly Australian and Polynesian.

No. 84. Wood of *Pittosporum bicolor*, Hk., and *P. undulatum*, Vent., from Victoria and New South Wales. White, adapted for turners' purposes and recommended as a substitute for the Box-wood used by engravers.

CASE **Guaiacum Order** (*Zygophyllaceæ*). Bearing opposite
 18. and usually compound leaves. The abundance, especially of spinous species, is characteristic of desert vegetation in Egypt and Western Asia. Some of them are fine trees, as that affording

No. 85. LIGNUM VITÆ (*Guaiacum officinale*, L.). Native of the West Indies, growing very slowly, and attaining a great size. The wood is remarkable for the singular brownish-green of the heart-wood, and its extreme hardness and toughness, which adapt it for pestles, mortars, rulers, etc. It contains a green resin used in medicine, which is obtained either from incisions in the trunk, or by heating the wood broken up into fragments.

Rue Order (*Rutaceæ*). Chiefly trees or shrubs, widely scattered over the warmer temperate regions of the globe; numerous in Australia, the Cape of Good Hope, and tropical America. The Order is characterized by the prevalence of a bitter, odorous, essential oil; the leaves being usually dotted with minute resinous gland-spots. The leaves and bark of several species are employed in medicine as febrifuges, antispasmodics, etc.

No. 86. Leaves and Oil of common RUE (*Ruta graveolens*, L.). A plant much esteemed in ancient and rustic medicine.

No. 87. BUCHU leaves, from three species of *Barosma* (*B. crenulata*, Hook., *B. serratifolia*, Willd., and *B. betulina*, Bart., etc. Growing at the Cape of Good Hope. A stimulant tonic.

Zanthoxylum Order (*Zanthoxylaceæ*). Woody plants, growing in tropical countries, allied to the Rue Order, and, like them, with pellucidly dotted and, usually, divided leaves. The species possess agreeably aromatic properties.

CASE **No. 88.** JAPAN PEPPER (*Zanthoxylum (Fagara) piperitum*,
 19. DC.). Used as a condiment in China and Japan. The fruit-capsules are remarkably fragrant when bruised, from a pungent aromatic principle residing in the tubercles of the rind.

No. 89. Stem of *Zanthoxylum Clava-Herculis*, L., of the CASE West Indies, with walking-sticks made from it. Observe the 19. curiously tubercled bark.

Quassia Order (*Simarubaceæ*). Trees or shrubs, growing mainly in the tropical parts of America and Africa, distinguished by an intense bitterness. Some species are employed medicinally as tonics.

No. 90. Seeds of the CEDRON (*Simaba Cedron*, Pl.), which in Central America are regarded by the native tribes as an antidote for the bites of venomous reptiles, scorpions, etc. Their virtues are probably much exaggerated.

No. 91. BITTER-WOOD: *Picranea excelsa*, Ldl., in the West Indies; *Quassia amara*, L., in Surinam: the former of these being one of the sorts employed to make the 'bitter cups' recently so extensively sold, and which, from the powerful bitter of the wood, communicate a taste to water left in them. Quassia chips are used medicinally as a tonic, etc.

Spindle-tree Order (*Celastraceæ*). A family of woody CASE plants, mostly extra-tropical, though widely spread, both in the 20. north and south hemispheres. In Britain the Order is represented by a single small tree, the Spindle-tree (*Euonymus europæus*, L.). The ripe fruits remain on this tree long after the leaves fall, and open while still attached, exhibiting the bright orange-coloured pulp (the arillus) in which the seeds are nestled. The young shoots formerly furnished skewers to the butchers.

Buckthorn Order (*Rhamnaceæ*). An extensive group of trees and shrubs, often armed with spines, and characterized by the structure of the flowers, which are usually small, and have the stamens opposite to the separate, minute petals. Found nearly all over the globe, excepting the extreme north. Two species grow in Britain.

Observe the stem curiously flattened in alternating, triangular joints, of

No. 92. *Colletia cruciata*, G. and Hk. A Chilian Shrub.

No. 93. PERSIAN OR YELLOW-BERRIES, the fruits of *Rhamnus infectorius*, L., and probably other species, used by the modern Greeks to dye Morocco leather; employed also in calico-printing.

No. 94. SAP-GREEN, a well-known pigment, obtained from the ripe berries of the common Buckthorn (*R. catharticus*, L.) and other species by the action of lime, etc.

No. 95. JUJUBE (*Zizyphus Jujuba*, Lam., and allied species). A wholesome fruit, preserved in syrup by the Chinese, after the surface has been scratched in numerous fine longitudinal lines.

No. 96. LOTE FRUIT (*Z. Lotus*, Lam.) of North Africa, said

CASE to be the Lotos of the ancient Lotophagi. (See 'Nelumbium
20. Order,' Case 2.)

No. 97. CHAW-STICK. Portions of the stem of *Gouania domingensis*, L., from the West Indies, used to clean the teeth.

CASE **Cashew-nut Order** (*Anacardiaceæ*). Chiefly large tropical trees, often with a resinous or caustic juice; several species bear very valuable fruit. They occur both in the Old and New Continents; some extend into temperate countries, a few reaching the South of Europe. The flowers are usually very small.

No. 98. MARKING NUTS, the fruit of an East Indian tree. (*Semecarpus Anacardium*, L. f.) The 'nut,' which contains a black, corrosive juice, rests upon a thickened stalk (peduncle), eaten by the natives. The resinous juice of the nut is employed in marking cotton cloths, being improved for the purpose by the addition of lime and water; it was formerly used in medicine.

No. 99. THE MANGO (*Mangifera indica*, L.) cultivated very generally in hot countries, though especially common, in a multitude of varieties, in India and the East Indian islands, where it is probably native. The Mango is esteemed a most delicious fruit; unripe it is used in tarts, preserves, etc.

No. 100. PISTACIA-NUTS. Fruit of *Pistacia vera*, L. A small tree of Western Asia and the Levant; now spread far along the shores of the Mediterranean. The kernels are pleasant to the taste, eaten raw or cooked with salt and pepper.

Observe the wood of *Pistacia terebinthus*, L.: one specimen presented by the Prince Jérôme Bonaparte.

No. 101. MASTIC. A resin obtained in the Greek Archipelago, chiefly in Scio, from incisions made in the bark of *Pistacia Lentiscus*, L. It is used as a varnish, and by dentists.

No. 102. CASHEW-NUT. Fruit of *Anacardium occidentale*, L., a tree of Brazil, Central America, and the West Indies. The edible portion is the swollen pear-shaped stalk (peduncle), which supports the nut. The kernel also is eatable when roasted.

CASE **No. 103. SUMAC.** The broken and powdered leaves and twigs of *Rhus Cotinus*, L., and *R. Coriaria*, L. Shrub of South Europe and the Levant. Extensively employed in tanning light-coloured leathers, and also as an orange-yellow dye.

No. 104. JAPAN WAX. Afforded by the small fruits of *Rhus succedanea*?, L. Employed in candle-making.

Observe the numerous specimens of gums and resins afforded by the Order. Many of these are not yet satisfactorily identified with the trees respectively producing them. The specimens of wood of several species are worthy of note.

The **Amyris** or **Myrrh Order** (*Amyridaceæ*). All CASE 22.
shrubs or trees, with compound, dotted leaves, growing in warm countries. Very many abound in fragrant balsams or resins, employed in medicine, fumigation, and perfumery.

Observe especially

No. 105. BDELLIUM, a resin, probably afforded by a species of *Balsamodendron*.

No. 106. MYRRH, afforded by shrubs of the Red Sea, Abyssinia, etc., species of *Balsamodendron*. Its use dates from high antiquity, being mentioned in the book of Exodus. Specimens in flower of Myrrh-producing plants are much wanted.

No. 107. BALM OF GILEAD or MECCA, obtained from incisions through the bark of *Balsamodendron gileadense*, Kth., a small shrub of Western Asia. It is now said to be extinct in Judæa and Egypt, where it formerly grew. The present small supply is obtained from Arabia.

Observe also

No. 108. GUM OLIBANUM, the product of certain species of *Boswellia*, growing in the South of Arabia and on the Somali coast. It is used in incense, on account of the aromatic vapour given off when burning.

[Further light is much needed upon the true sources of these resins; and specimens of the shrubs (in flower or fruit) which furnish them, accompanied by a sample of the product, would be very valuable.]

Leguminous or **Peaflower Order** (*Leguminosæ*). The specimens and products illustrating this great Order, extend from Case 22 to Case 31. The species number about six to seven thousand. They are either herbs, shrubs, or trees, and are widely distributed over the surface of the globe. One section of the Order is marked by the curious form of the flower, the petals being unequal in size, and disposed in a form which has suggested the name *Papilionaceous*, or butterfly-like. The fruit is commonly a pod (legume) more or less resembling that of the Bean or Pea. Many species are natives of Britain (Broom, Whin, Clover, etc.), and large numbers are cultivated, both as important food plants (Peas, etc.), and for ornament (Acacias, Laburnum, Lupin, etc.). This large Order is subdivided into three principal groups. The true Peaflowers or

Papilionaceæ: containing most of the esculent plants;

Cæsalpinieæ: furnishing Senna, Logwood, Tamarinds, etc.;
and

Mimoseæ: Gum Arabic, Catechu, etc.

§ *Papilionaceæ.*

CASE **No. 109.** SUNN HEMP of India (*Crotalaria juncea*, L.), extensively cultivated for the sake of its fibre, especially in Mysore and the Deccan. By proper treatment it becomes soft, fine, and white, bearing comparison with flax.

No. 110. BASKETS and MATS made of the twigs of the YELLOW BROOM (*Genista scoparia*, Lam.).

No. 111. Samples of RED and WHITE CLOVER-SEED (*Trifolium pratense*, L., and *T. repens*, L.). Upwards of 256,000 cwts. of 'Clover and Grass' seed were imported in 1874. Frequently adulterated with old and dead, or kiln-dried seed, and with the cheaper Hop-clover (*T. procumbens*, L.), etc.

No. 112. INDIGO. Samples from the East and West Indies. Obtained principally from two or three species of *Indigofera* (*I. Anil*, L., *I. tinctoria*, L., etc.), by soaking the plant in large masses, in tanks. After its removal, the water is stirred and beaten by paddles, its colour passes to a blue, and the suspended particles settle to the bottom, forming a blue mud, which, after the water is drawn off, is dried in the sun and cut up into cakes. Of this valuable dye-stuff, 85,767 cwts. were imported in 1874.

No. 113. TRAGACANTH, a viscid gum, yielded by several species of *Astragalus* growing in Asia Minor. [Specimens of Tragacanth-yielding species, with information on the mode of collecting the gum, are much wanted.]

No. 114. LIQUORICE ROOT (*Glycyrrhiza glabra*, L.), cultivated chiefly in Spain and Italy, and to some extent, in the South of England and Yorkshire. 'Spanish Juice' is the sweet extract evaporated to dryness. Made up with gum, gelatine, etc., it forms 'Pipe-juice' and other confections.

CASE **No. 115.** Models of varieties of the cultivated PEA (*Pisum sativum*, L.), probably native originally of countries bordering the Black Sea.

No. 116. LENTILS, seeds of *Ervum Lens*, L. Cultivated also by the Hebrews and ancient nations. The flower is often sold under the name of 'Ervalenta' or 'Revalenta.'

No. 117. GRAM or CHICK PEA. Seeds of *Cicer arietinum*, L. An annual herb, cultivated from an early period in warm countries, especially in India, where it is used in cakes, curries, etc. It was known to the ancient Egyptians, Hebrews, and Greeks. The plant is said to abound in Oxalic Acid.

CASE **No. 118.** GROUND NUTS. Pods and seeds of *Arachis hypogæa*, L. Remarkable from the plant, after flowering, forcing the young pods underground, where they ripen. Extensively

grown in warm climates as an important article of food, and CASE for the sake of its oil. Its native country is doubtful; M. A. 25. de Candolle thinks it of American origin.

No. 119. WEST INDIAN EBONY. Furnished by *Brya Ebenus*?, A. DC., a small tree of Jamaica. It takes a beautiful polish, and is used for making walking-sticks, inlaying, etc.

No. 120. SHOLA (and SINGAPORE HAT of the same), the wood of *Æschynomene aspera*, L. A marsh plant, growing in the lakes and jheels of India. It is a bad conductor of heat. Often worked into models of temples, flowers, etc. Note also a model of a Hindoo temple made of the same.

No. 121. Seed of MUCUNA, drifted across the Atlantic by CASE the Gulf Stream from the West Indian Islands to the Azores 26. and Norwegian coast, where they are occasionally picked up.

No. 122. ORDEAL BEANS of Old Calabar, West Africa. The seeds of *Physostigma venenosum*, Balf., a most remarkable poison.

No. 123. CRABS'-EYES, seeds of *Abrus precatorius*, L., used in India by jewellers and druggists as weights, being nearly uniformly each one grain. They are strung together for necklaces, rosaries, etc.

No. 124. A series showing the variety in structure of the fruit obtaining in the group of *Dalbergiæ*, arranged by George Bentham, Esq.

No. 125. ROSEWOOD. Specimens from Brazil and Central America. The best Brazilian Rosewoods, exported from Rio, are afforded by species of *Dalbergia*. [We are very ignorant of the trees furnishing the different varieties of this valuable cabinet-wood, and authentic specimens of flower and fruit, from the timber-producing trees, with sections of the wood, are much wanted.]

No. 126. TONQUIN BEANS (*Dipteryx odorata*, Willd.), from CASE Guiana. They are very fragrant, and are used to scent snuff. 27.

No. 127. RED SANDERS WOOD (*Pterocarpus santalinus*, L. f.), affording a reddish-brown dye, used for woollen cloths.

No. 128. AFRICAN ROSEWOOD (*Pterocarpus erinaceus*, Poir.), with fruit-bearing twig, from the Gambia. The source of this wood was unknown previous to the receipt of these authentic specimens. *P. erinaceus* affords the African resin Kino.

No. 129. BALSAM OF PERU, yielded by *Myroxylon Pereiræ*, Klotzsch, (*Myrospermum Pereiræ*, Royle). A tree of (not Peru, but) Central America. The Balsam exudes from incisions made in the bark. Balsam of Tolu is furnished by *Myroxylon Toluifera*, HBK. An evergreen tree of Venezuela and New Grenada.

§ *Cæsalpinieæ*.

CASE

27. **No. 130.** LOGWOOD. The heart-wood of *Hæmatoxylon Campechianum*, L., a large tree of Central America (Honduras, Campeachy, etc.) and the West Indies, imported in logs, which are cut up into chips and ground for the use of dyers and printers. Esteemed as one of the best deep-red and black dyes.

No. 131. Seeds of *Guilandina Bonduc*, L., a common shrub on tropical shores. They are sometimes washed up by the Atlantic current on the Irish Coast; they are stated to have germinated after the voyage.

No. 132. DIVI-DIVI PODS (fruit of *Cæsalpinia Coriaria*, Willd.). A powerful astringent, imported from South America, for the use of tanners.

CASE **No. 133.** SAPPAN WOOD (*Cæsalpinia Sappan*, L.). A red dye-wood, imported from India and Ceylon.

No. 134. SENNA. The leaves of two species of *Cassia* (*C. acutifolia*, Del., and *C. angustifolia*, Vahl.), imported from Egypt, Arabia, and East Indies. Well known as an important purgative medicine.

No. 135. JURUPARIS, sent by Mr. Spruce from the Uaupés, a branch of the Amazon, where they are used on the occasion of certain superstitious rites as musical instruments. They are wrapped up in folds of the bark of *Parivoa grandiflora*, Aubl. (See Case No. 50, Museum No. II.)

No. 136. TAMARINDS. The pulp of the pods of *Tamarindus indica*, L., imported from India and the West Indian Islands, preserved in sugar or syrup. Observe the tables and chairs near Case 25 made of the Tamarind Wood.

No. 137. COPAL, various commercial varieties of. The produce, principally, of *Trachylobium Hornemannianum*, Heyne, a tree of Zanzibar. [The best Copal is that which is dug from the ground near the roots of trees, or where the trees once stood, and is in a semi-fossil state. Specimens of the flower and fruit of other Copal-trees are requested. Indian Copal, or *Piney varnish*, is a product of *Vateria indica*, L. 'Dipterocarp Order,' Case 9.]

No. 138. Stems of species of *Bauhinia*, showing a remarkable mode of growth, being flattened and corrugated in the middle; they are termed 'Land-turtles' Ladders.

No. 139. Balsam of *Copaiba* imported from Brazil, and produced by species of *Copaifera*. [Specimens of the Balsam-producing species with the balsam of each are much needed.]

No. 140. WOOD of WEST INDIAN LOCUST-TREE (*Hymenaea* CASE
Courbaril, L.), tough and close-grained, valuable for trenails 28.
and timber of steam-engines. Some of the Brazilian Locust-
trees, according to Von Martius, attain a size so great that
fifteen Indians with outstretched arms could just embrace one
of them.

Observe specimens of the seeds of a species of *Mora* from
Central America, probably containing the largest Dicotyle-
donous Embryo.

No. 141. CAM-WOOD, furnished by a West African tree.
(*Baphia nitida*, Lodd.); the red dye of Bandana handkerchiefs.

No. 142. CAROB-PODS, the fruit of *Ceratonia Siliqua*, L., a
tree of South Europe, the Levant, etc. The legumes contain
a sweet pulp, and are now extensively imported for cattle-food.
The seed of this tree is the original of the carat of jewellers.

§ *Mimoseae*.

No. 143. Seeds of *Entada scandens*, Bth., a climbing Indian
shrub. They measure about two inches across, and are made
into little boxes, etc. Some of the legumes (**No. 144**) measure
about four feet in length by four to five inches in breadth.

Observe the curious pod of *Tetrapleura Thonningii*, Bth., from
West Africa, remarkable for the strong ridge down the back
of each valve.

[Observe also the specimens of very valuable Australian CASE
timbers, known under the names of Australian 'Sallow,' 29.
'Wattles,' 'Wild Tamarind,' etc., afforded by species of *Acacia*,
some of them of great beauty. Specimens of flower and fruit
with sections of the wood are especially requested.]

No. 145. GUM ARABIC. The produce of various species of CASE
Acacia (*A. arabica*, Willd., *A. Vereke*, G. and P., etc.), exuded 30.
spontaneously or from incisions in the bark; formerly brought
from Arabia. By far the largest supplies are now shipped
from Egypt.

No. 146. CATECHU, prepared by boiling the heart-wood and
pods of *Acacia Catechu*, Willd., an East Indian tree. It con-
tains much tannin, and is extensively imported from India for
the use of tanners. The word *Catechu* signifies tree-juice.
The names of 'Cutch,' and 'Terra-japonica,' have also been
given to this substance, but these are distinguished in com-
merce. 'Terra-japonica' being obtained from *Uncaria Gambir*,
Roxb. [See also Case 46, 'Gambir.']

No. 147. NIOPE SNUFF, made from the pods of *Acacia*
Niopo, H. B., by the Indian tribes of the Rio Negro, South
America, with the instruments used in its preparation.

CASE In this case are numerous miscellaneous fibres, woods, etc.,
 31. believed to be furnished by members of the Leguminous Order, the species being undetermined.

CASE **Rose Order.** (*Rosaceæ*). A numerous family of plants,
 32. either trees, shrubs, or herbs, abounding principally in cool and temperate climates, and including many species of great importance. The Apple, Cherry, Rose, and Strawberry may be taken as familiar types of the group.

The Order is divided into sections or tribes—

§ *ROSEÆ*. *Rose* and *Bramble* as type.

§ *DRUPACEÆ*. *Almond*, *Peach*, and *Cherry*.

§ *POMACEÆ*. *Apple*, *Hawthorn*.

§ *SANGUISORBEEÆ*. Small group of herbs and undershrubs.

The *Ladies Mantle*.

§ *CHRYSOBALANEÆ*. Tropical trees and shrubs, some bearing eatable stone-fruit.

§ *Rosææ*.

No. 148. KOUSO, the flowers of *Brayera anthelmintica*, Kth., an Abyssinian tree; a celebrated vermifuge.

No. 149. QUILLAI BARK (*Quillata saponaria*, Mol.), used in Chili and Brazil instead of soap to remove grease from cloth, etc.

No. 150. ROSE BEDEGUARS: "Robin Redbreast's pin-cushions." Mossy excrescences often found on the common Dog-rose (*Rosa canina*) in hedges; they are occasioned by the puncture of insects, chiefly *Cynips Rosæ*, and *Ichneumonidæ*. Observe the Bedeguards cut across, showing the cavities containing the larvæ.

No. 151. ATTAR OR OTTO OF ROSES, obtained from the petals (flower-leaves) of sweet-scented species of Rose (*Rosa gallica*, L., *R. centifolia*, L., *R. damascena*, L.). The 'Otto' of the London market is chiefly produced in Turkey; some is also obtained in the South of France, Tunis, and Persia, as well as at Ghazepore, in India. The Turkish Otto is almost invariably adulterated with the oil of an Indian *Andropogon* (Case 33, Museum No. II.).

§ *Drupaceæ*.

Observe the wood of various species of *Prunus*, including the Cherry (*P. Cerasus*, L.), Garden and Portugal Laurel (*P. Lauro-Cerasus*, L., and *P. lusitanica*, L.); these latter do not belong to the true Laurel Order (Cases 70-72).

No. 152. ALMONDS.—JORDAN, VALENCIA, and BITTER,—the CASE kernel of the fruit of different varieties of *Amygdalus communis*, 33. L., a Mediterranean tree, extending into Persia, cultivated in the North of Africa, Italy, Spain, etc. Jordan and Valencia Almonds are imported from Malaga and other Spanish ports. Bitter Almonds chiefly from Barbary, Sicily, etc.

No. 153. OIL and ESSENTIAL OIL (Essence) of Almonds. Observe also Almond-cake, remaining after the expression of the oil. With the addition of water, this cake yields, on distillation, the Essential Oil of Almonds, the residue being used to feed cattle. Several species of this section of the Rose Order contain a considerable amount of Prussic (Hydrocyanic) Acid; the oil of the common Laurel and Bitter Almond is, owing to its presence, a virulent poison.

§ *Pomaceæ*.

No. 154. Wood of the HAWTHORN (*Cratægus Oxyacantha*, CASE L.), and its variety the *Glastonbury Thorn*. 34, 35.

No. 155. REFUSE 'TRASH,' left in cider and perry making, used in Switzerland as fuel for stoves.

No. 156. Wood of the Apple and Pear-trees (*Pyrus Malus*, L., and *Pyrus communis*, L.) and of the Mountain Ash, Rowan or Rodden tree (*Pyrus Aucuparia*, Gært.); the last useful as a nurse-tree in plantations, enduring severe exposure. Formerly regarded with superstitious veneration as a charm against witchcraft, etc.

No. 157. The QUINCE (*Cydonia vulgaris*, Pers.). The fruit is eaten stewed, in tarts and confectionery, or made into marmalade. It grows wild in the South of Europe.

No. 158. The LOQUAT, a dessert fruit afforded by *Mespilus* (*Eriobotrya*) *japonica*, Thb. A native of China and Japan.

No. 159. The MEDLAR (*Mespilus germanica*, L.). Common in many parts of Europe, and occurring in English hedgerows.

§ *Chrysobalanææ*.

No. 160. The Bark of the CARAÏPI, or POTTERY-TREE of Para (*Moquilea utilis*, Hk. f.). The powdered bark, baked with equal quantity of clay, makes vessels for domestic use, capable of withstanding a great amount of heat.

No. 161. Vessels for heating milk, etc., made as above stated.

Loosestrife Order (*Lythraceæ*). Principally herbs with entire, opposite leaves, widely dispersed over the globe, some of the tropical species being shrubs or trees.

CASE 35. The common *Purple Loosestrife* of wet ditches, represents the Order in Britain.

No. 162. HENNA, the powdered leaves of *Lawsonia inermis*, L., made up into a paste, and used by the Egyptian ladies to dye their nails, by way of ornament, an orange-colour. The colour lasts from three to four weeks without renewal.

CASE 36. **Mangrove Order** (*Rhizophoraceæ*). Opposite-leaved trees, growing up on the muddy shores of tropical countries. Chiefly remarkable for the seeds germinating in the fruit, forming a long root before dropping into the ground, which they sometimes reach before becoming detached.

No. 163. Germinating seeds of the MANGROVE, *Rhizophora Mangle*, L.

No. 164. MANGROVE BARK; from its astringency, used in tanning.

Myrobalan Order (*Combretaceæ*). All tropical trees and shrubs, growing in both hemispheres. They are characterized by some degree of astringency.

No. 165. MYROBALANS, the fruits of Indian species of *Terminalia*, are imported for the use of tanners. Some of the Indian *Terminalias* afford valuable timber.

Passing the 'Melastom' Order—a very large tropical family, characterized by opposite three-veined leaves, and splendid flowers with curious stamens, but affording very few economic products—and the small 'Alangium' Order, the head of the stairs is again reached.

MIDDLE FLOOR.

The collection is continued in the same order through the Cases of this Floor, commencing immediately to the left, round the corner on reaching the head of the first flight of stairs from the Ground Floor.

CASE 37. **Myrtle Order** (*Myrtaceæ*). A very large Order, numbering about 1300 species, trees or shrubs; abounding in hot countries, especially South America, the East Indies, and Australia. The most northern member is the common Myrtle (*Myrtus communis*, L.), a native of Southern Europe.

The Order abounds in a volatile oil, frequently fragrant, and giving character to the products of the group. The opposite and evergreen leaves, dotted with numerous little oil-glands, are marked by a vein running round the margin, just within the edge of the leaf. None of the Order have blue flowers. Observe the numerous specimens of Australian woods furnished by the genera *Melaleuca* (Australian Tea-trees, etc.) and *Eucalyptus*

(the Gum, Iron-bark, and Stringy-bark). Some of the Gum **CASE** and Stringy-bark trees rise to an enormous height, having 37. straight, unbranched trunks, from 100 to 150 feet in height. Note also the variety in structure of the bark.

No. 166. Bark, annually shed, of *Melaleuca leucadendron*, L., used for thatching.

No. 167. Specimens of gum, essential oils, and other products, from various species of *Eucalyptus*. Note a series of fruits of *Eucalypti*.

No. 168. WOOD OF BLUE GUM (*Eucalyptus globulus*, Lab.), of Tasmania and South-east Australia.

No. 169. Bark of a *Eucalyptus*, on which rude drawings **CASE** have been sketched by the Aborigines of Victoria. 38.

[Specimens of the timber of Australian 'Gum,' 'Stringy,' and 'Iron-bark' trees, with *flowering branches* from the same trees, would be highly valued; they are required to remove the uncertainty at present felt as to the precise source of these valuable woods.]

No. 170. POMEGRANATES, the produce of *Punica Granatum*, L., cultivated from early antiquity for its valuable fruit; believed to have been originally a native of Western Asia, from the Mediterranean to Persia and the interior, and not of Carthage, as its name would denote (*Malum punicum*). It was known to the Hebrews under the name *Rimmon*, and is mentioned in Deuteronomy as a product of Palestine; the root is an excellent vermifuge. The bark has been used in dyeing, and it is this which gives the colour to yellow morocco leather.

No. 171. GUAVAS. Two varieties—the Apple or red, and **CASE** Pear-shaped or white—afforded by *Psidium pomiferum*, L., and 39. *Psidium pyrifera*, L., commonly cultivated as dessert-fruits in tropical countries. M. A. de Candolle considers the Guava of Central American or Mexican origin.

No. 172. ALLSPICE, PIMENTO, OR JAMAICA PEPPER, the dried, unripe fruits of *Pimenta officinalis*, Ldl. (*Myrtus Pimenta*, L.), a tree carefully cultivated in Jamaica; from whence large quantities are imported into this country.

No. 173. CLOVES. The dried, unopened flower-buds of *Caryophyllus aromaticus*, L., originally brought from the Moluccas; now cultivated for this valuable spice in Eastern Africa, West Indies, etc. The oil of Cloves is prepared from Cloves by distillation. Observe the curious and fragrant ornamental models from Amboyna made of Cloves strung together.

No. 174. ROSE APPLES, the fruit of the *Jambosa vulgaris*, DC., an Indian or Malayan Tree.

CASE No. 175. Wood of species of *Acmena*, Australian trees not thoroughly determined.

CASE 40. Monkey-pot Order (*Lecythideæ*). Large trees, with scattered, undotted leaves, closely allied in structure to the Myrtles. The fruit of the Monkey-pots is very remarkable, consisting of a hard, round, or lengthened capsule, containing the seeds, and opening transversely by a lid at the top. They grow in the forests of the hottest parts of South America.

No. 176. SAPUCAIA NUTS, the edible seeds of *Lecythis Zabucajo*, Aubl., *L. Ollaria*, L., gigantic forest-trees of Brazil and Guiana.

No. 177. BRAZIL-NUTS, about twenty-one of which are contained in one of the hard-shelled fruits of the *Bertholletia excelsa*, H.B., an enormous tree, growing on the Amazons.

No. 178. Fruit of the CANNON-BALL tree (*Couroupita guianensis* Aubl.), from St. Vincent's.

Passing the small tropical 'Barringtonia' Order, also allied to the Myrtles.

Mare's-tail Order (*Haloragææ*). A group of shrubs and herbs, growing in marshy places, bearing small, and often very reduced, flowers.

No. 179. WATER CHESTNUTS, the horned fruits of *Trapa bicornis*, L., *T. bispinosa*, Rxb., and *T. natans*, L., growing in ponds, lakes, etc., in temperate Europe and Asia. In China and also Kashmir the fruits of the Water Chestnut are important articles of food, and are collected in large quantities.

CASE The Evening Primrose Order (*Onagrææ*). Herbaceous plants or shrubs, mostly of temperate countries; some species, chiefly American, bearing beautiful and showy flowers, as the Clarkias and Fuchsias of Gardens; Willow-Herbs are among the British members of the group. They do not possess any marked properties.

The Gourd Order (*Cucurbitaceæ*). A group of prostrate or climbing plants, with palmately-lobed leaves and tendrils,—chiefly tropical, with but few species extending into cool regions. Cucumbers (*Cucumis sativus*, L.) and Melons (*C. Melo*, L.) belong to the Order. Many of the species are acrid and purgative.

No. 180. TOWEL GOURDS (*Luffa aegyptiaca* DC.), grown in the West Indies and West Africa. The close vascular network of the inside of this gourd serves as scrubbing-brush, sponge, and to strain Palm-wine. It is also worked up into light ornamental articles, baskets, etc. Observe the variety in form of the fruit of various species of gourd here exhibited, especially

the snake and viper gourds (*Trichosanthes anguina*, L., and *T. CASE*
colubrina, Jq.). 41.

Specimens of Poterion, Custard, Portmanteau, etc., gourds CASE
(*Cucurbita maxima*, Duch., and allied species), forms chiefly 42.
due to long-continued cultivation and selection of a stock probably originally wild in Southern Asia. The Greeks and Romans were acquainted with several varieties of gourd.

Case 43 contains also a large collection of tropical Gourds CASE
and Calabashes, some of remarkable size and shape; they are 43.
principally the shells of the fruits of *Lagenaria vulgaris*, Ser., and *Cucurbita maxima*, Duch. They are employed for an innumerable variety of purposes,—as domestic utensils, drums, musical instruments, snuff-boxes, etc. The outer surface is often elaborately carved.

[The name *Calabash* is also applied to the shell of the fruit of *Crescentia*. See Case 61.—In Museum No. II., a huge Gourd is suspended from the ceiling in the large room.]

No. 181. The PAPAWE, fruit of *Carica Papaya*, L. (*Papaya vulgaris*, DC.) Though now scattered widely through tropical countries in both hemispheres, it is believed to have originally spread from the warm parts of the American continent. The fruit is edible. The Papaw possesses the remarkable property of rendering meat newly killed tender in a few hours by being suspended among its leaves, causing a separation of the muscular fibres.

Observe the small *Pangium* Order, Indian trees allied to the Papaws, and the *Purslane* Order, succulent plants often bearing gay flowers, including

No. 182. PURSLANE (*Portulaca oleracea*, L.). A potherb and salad, occurring in sterile places over an immense area in both hemispheres: it is a valuable antiscorbutic. Observe also the *Napoleona* Order, a small West-African group of trees bearing flowers of a remarkable structure; and the

Fig-Marigold Order (*Ficoideæ*). A tribe of succulent plants, remarkably characteristic of the hot desert plains of the Cape of Good Hope; their flowers are often very beautiful. From their succulent nature, specimens serviceable for purposes of botanical comparison are necessarily preserved in fluid. A large collection of species of *Mesembryanthemum*, flowering in the Royal Gardens is here exhibited, continued also in Case 44.

Indian Fig Order (*Cactaceæ*). A singular group of CASE
succulent shrubs, most variable in form—angular, flattened, or 44.
almost spherical, and frequently spinous, bearing often large

CASE and showy flowers. They are almost exclusively *American*,
 44. although the Indian Fig (*Opuntia Ficus-indica*, Webb), has long been naturalized in Southern Europe.

No. 183. Fibrous portions of the stem of *Opuntia*, made up into various ornamental articles.

No. 184. COCHINEAL. Small hemipterous insects subsisting upon an Indian fig (*Opuntia*), to which the wingless females attach themselves. Cultivated in Mexico, Brazil, and the Canary Islands, for the sake of their rich crimson dye. 39,177 cwts. of Cochineal were imported in 1874.

No. 185. Portions of the OLD MAN CACTUS (*Cereus senilis*, Salm.), so-called from the hoary aspect of the columnar stems. One species in Western North America (*C. giganteus*, Engl.) attains a height of 45 to 50 feet.

No. 186. *Oxalate of Lime* deposited in immense quantities in the tissues of some Cactuses (*Cereus* spp.).

Note, in Cases 44 and 45, the small Orders of *Gooseberry* and *Currant*, shrubs of temperate climates with acid edible fruits; of *Saxifrages*, herbs of northern and mountainous countries; and of *Witch-Hazels*, a small group of trees and shrubs, widely dispersed over the globe. Two or three species of one section of the latter Order afford balsamic resins, as

CASE **No. 187.** LIQUID STORAX, obtained by boiling the bark of
 45. *Liquidambar orientale*, Mill., a tree of Asia Minor.

Umbellifer Order (*Umbelliferae*), so called from the arrangement of the flower-stalks in heads or 'umbels.' There are about 1500 species, all herbaceous, and abounding in temperate climates. The products of the group vary much in character. Some are acrid and virulently poisonous, some secrete gum-resins, others again are aromatic and useful as condiments. Celery, Fennel, Parsnip, Carrot, and Parsley, are all familiar esculents belonging to the Order.

No. 188. Umbels of *Ammi Visnaga*, Lam., brought from Africa and the Levant to Marseilles. The "rays" are used as tooth-picks.

No. 189. ASAFCETIDA, a gum resin obtained from the thick roots of *Narthex asafœtida*, Falc., *Scorodosma fœtidum*, Bge., and allied species growing in Tibet and Central Asia.

No. 190. GUM AMMONIACUM, obtained from *Dorema ammoniacum*, Don., and *D. Aucheri*, Boiss., in Persia and Armenia. Specimens of the plants are upon a lower shelf.

No. 191. GUM GALBANUM, afforded by *Ferula galbaniflua*, Buh., and *F. rubricaulis*, Boiss., plants of Persia. Galbanum is said to be brought into commerce chiefly from Eastern

Europe. [Specimens in fruit of any Umbellifer from Central Asia, yielding gum-resin, with a sample of the product, collected by an eye-witness would be greatly valued.] CASE 45.

No. 192. HEMLOCK LEAVES and SEEDS (*Conium maculatum*, L.). A powerful narcotic, used in medicine. The juice, probably mixed with Opium, was given by the Athenians to citizens condemned to death, as in the case of Socrates and Phocion. It is common in waste places; the stem is often marked with small brown blotches.

No. 193. EPIDERMIS of the leaves of *Hermas gigantea*, L., separated from the veins and midrib by the Hottentots of South Africa. Used as a tinder, and made into miniature socks, gloves, etc.

No. 194. GUM SAGAPENUM, a rare drug, believed to be the produce of an Umbellifer of Western Asia. Perhaps *Ferula persica*, Willd., or *F. Szowitsiana*, Dec.

No. 195. BALSAM BOG (*Bolax glebaria*, Com.), a singular feature in the landscape of the Falkland Islands, forming huge, hard, and perfectly hemispherical hillocks, often two to four feet in height. It yields a gum which has been used in medicine. [A "hillock" of the plant is exhibited in a glass case in the passage of Museum No. 11.]

No. 196. SUMBUL, or MUSK-ROOT (*Euryangium Sumbul*, Kauf.), from Central Asia.

Observe the fruits, familiarly known as seeds, of various aromatic species, Caraways (*Carum Carui*, L.), Cumin (*Cuminum Cyminum*, L.), Fennel (*Foeniculum vulgare*, Gært.), Corianders (*Coriandrum sativum*, L.), etc.

Ivy Order (*Araliaceæ*). Resembling the Umbellifers in many respects, but chiefly woody-stemmed; many of the species grow in hot countries.

No. 197. VIRGINIAN SASSAPARILLA, the climbing stem of *Aralia nudicaulis*, L. Used medicinally in the United States.

No. 198. RICE PAPER. A valuable and instructive series illustrating the preparation of the 'paper' from the pith of *Fatsia* (*Aralia*) *papyrifera*, Bth., a tree of Formosa; with the large knives used to cut sheets from the cylinders of pith, specimens of the paper made into bundles (100 squares of about 2½ or 3 inches, being sold by the Chinese for 1¼d. or 1½d.), dyed rice-paper, artificial flowers, etc.

[Flower-paintings on rice-paper, by Chinese artists, are suspended on the ends of cases No. 43 to 47.]

No. 199. ROPE made of fibre from the Common Ivy (*Hedera Helix*, L.).

CASE No. 200. GINSENG, the root of *Panax Schinseng*, Nees-45. Native in North China or Mandschuria. So highly valued as a restorative medicine in China, that it is sold at from 20 to 250 times its weight in silver, sometimes for 500 times this amount. It possesses no important medicinal properties.

Observe the HONEYSUCKLE ORDER, represented in Britain by the Woodbine and Elder—the flowers and berries of the latter are useful in household economy; and the CORNELL ORDER, to which the Dogwood of shrubberies belongs.

Mistletoe Order (*Loranthaceæ*). A remarkable group of shrubs, almost invariably parasitical upon other plants, with leaves usually opposite, thick, and fleshy. In tropical countries numerous species abound, some with large, brilliantly coloured flowers. These have not yet been introduced into our hot-houses. In Europe, the Order is represented by the MISTLETOE (*Viscum album*, L.).

No. 201. Sections showing the close union which takes place between the wood of the Mistletoe and that of the Apple, Thorn, and Lime trees, upon which it generally grows.

These parasites, frequently decaying after death, before the stock upon which they grow, leave curiously furrowed moulds or casts, answering to the space occupied by their attachment. See specimens in this Case.

CASE 46. Peruvian Bark Order (*Rubiaceæ*). A very large Order, numbering about 2800 to 3000 species; common in tropical countries. Characterized by opposite undivided leaves, having scales (*stipules*) between the bases of the stalks. A small section (*Stellatæ*), differing in having their leaves in rings or whorls of from four to eight, represents the Order in cool countries. Several species afford most important economic products.

No 202. QUININE. The most important tonic and febrifuge, obtained from the bark of various species, belonging to the genus *Cinchona*, a group of trees growing upon the slopes of the Andes, in Peru and Bolivia. From the scarcity of accessible trees affording good bark, and its consequent high price, the British Government have very successfully introduced plants into the cooler districts of India, where the annual consumption of Quinine is enormous. The Dutch Government have also established some species in the island of Java.

Various named varieties of *Cinchona* and *Cascarilla* barks are exhibited in this Case; also an etching of a scene in a Cinchona forest, from Dr. Weddell.

No. 203. IPECACUANHA. The root of *Oephaëlis Ipecacuanha*, Rich. A Brazilian shrub, the cultivation of which has been recently introduced into India. The roots afford the important emetic medicine. CASE 46.

No. 204. GAMBIR, called also 'TERRA JAPONICA,' an astringent extract, prepared by boiling down the leaves and shoots of *Uncaria Gambir*, Rxb., a climbing, hooked shrub, growing in the Malay peninsula and islands, used by tanners and dyers. 16,728 tons of 'Terra japonica' were imported in 1874.

No. 205. NEGRO PEACH, of Sierra Leone. The dense fruit-heads of *Sarcocephalus esculentus*, Afz.

No. 206. COFFEE, the seeds of *Coffea arabica*, L. A tree, native in Abyssinia and tropical Africa, now widely cultivated in hot countries. Ceylon, Java, the West Indies, Brazil, and Central America, afford the principal supply of this important product. From Ceylon alone, upwards of 548,000 cwts. were imported in 1874. The fruit of the Coffee-tree, which resembles a cherry in size and colour, contains two seeds (beans), which are separated by mechanical contrivance from the pulp; after washing, to remove the adhering mucilage, and exposure sufficient to 'cure' the seeds, they pass through a rolling-mill, which removes the parchment-like husk immediately enclosing the seeds. The commercial value depends on the size, form, and colour of the beans, and their flavour. Specimens of the different Coffees of the London market are here exhibited. The total importation of Coffee in 1874 amounted to 1,414,071 cwts., upwards of 284,000 being entered for home consumption. CASE 47.

No. 207. MADDER, the root of *Rubia tinctorum*, L., cultivated expressly for the sake of its valuable red dye, in France, Southern Europe, and the Levant.

No. 208. INDIAN MADDER, or MUNJEET, from an allied species (*Rubia cordifolia* L.), another important red dye imported from Northern India. Of Madder and Garancine (the latter prepared from Madder by the action of sulphuric acid), upwards of 264,000 cwts. were imported in 1874.

Valerian Order (*Valerianaceæ*). Herbs of temperate climates often aromatic or strong-scented. CASE 48.

No. 209. SPIKENARD, the root of *Nardostachys Jatamansi*, DC., a plant of Northern India, highly valued in India from a remote period as a perfume. Observe also the

Teazle Order (*Dipsacæ*). A small group of plants, destitute of important properties, having numerous flowers collected into dense heads, from which in some species the

CASE 48. flower-leaves (bracts) project in pointed or hooked processes, as in

No. 210. The FULLER'S TEAZLE (*Dipsacus fullonum*, Mill.). Cultivated in Yorkshire and on the Continent, for the use of woollen cloth manufacturers, who use the heads fixed in frames to give a 'nap' to their fabrics by raising to the surface some of the fine fibres of the wool. The heads are assorted commercially in different sizes and qualities, known as 'King's,' 'Queen's,' 'Seconds' and 'Buttons.' Every piece of fine broadcloth requires from 1500 to 2000 teazles to bring out the proper nap, after which they are useless.

Composite Order (*Compositæ*). One of the largest and at the same time most naturally defined families of the Vegetable Kingdom: it is found almost all over the globe, from the tropics to very high latitudes. The Order is botanically marked by the flowers (florets) being collected into dense heads, the whole resembling a single flower, as in the Daisy and Dandelion; the stamens united in a ring by their anthers, and the simple structure of the fruit. Some species abound in a bitter aromatic principle, as the Wormwoods and Chamomile; others afford a milky, narcotic, or bitter juice, as the Lettuce and Dandelion.

No. 211. EPIDERMIS of the leaves of *Andromachia igniaria*, H.B., from Quito, used as tinder.

CASE 49. **No. 212.** JERUSALEM ARTICHOKEs, the tubers of a Sun-flower (*Helianthus tuberosus*, L.), originally introduced from some part (now unknown) of the American continent.

No. 213. SAFFLOWER. A beautiful rose-colour, used as a dye and rouge, obtained from the flowers of *Carthamus tinctorius*, L. Cultivated in China, India, the South of Europe, etc.

No. 214. CHAMOMILES, the flowers of *Anthemis nobilis*, L., and common Wild Chamomiles (*Matricaria Chamomilla*, L.), well-known stimulating tonics.

Observe, on the lower shelf of this compartment, flowers, whole and pulverized, of *Pyrethrum roseum*, Bieb., a very efficient insect destroyer.

No. 215. *Scleroleima forsteroides*, Hk. fil., forms dense green cushions on the summits of the Tasmanian mountains.

CASE 50. **No. 216.** CHAPLET, or 'IMMORTELLE,' made of the flowers of an 'Everlasting' (*Helichrysum* sp.), commonly hung about tombs on the Continent.

No. 217. *Raoulia eximia*, Hk. fil., grows in large tufts on the mountains of New Zealand, where it is called the "Sheep plant," from its resemblance, even at a short distance, to that animal.

No. 218. CAFFER TEA, the leaves of *Helichrysum nudifolium*, CASE Less. Rather common in the Cape Colony ; used medicinally. 50.

No. 219. CHICORY, the root of *Cichorium Intybus*, L., cultivated in England, Germany, and other parts of Europe, for the purpose of mixing with coffee, which it is considered by some to improve. The roots are sliced, kiln-dried, roasted, and ground.

No. 220. DANDELION-ROOT (*Taraxacum Dens-leonis*, Desf.), now a troublesome weed almost wherever cultivation extends. A common rustic medicine. Observe crystallized mannite from the Dandelion.

No. 221. DOGWOOD of Tasmania (*Bedfordia salicina*, DC.).

No. 222. MUSKWOOD of Tasmania and New South Wales CASE (*Eurybia argophylla*, Cass.). Close-grained and taking a good 51. polish, it is useful in cabinet-work.

Observe the **Storax Order**, a small group of woody plants affording the fragrant resins Benzoin and true Storax.

No. 223. STORAX, a gum-resin obtained from wounds in the stem of *Styrax officinale*, L., a small tree of Asia Minor and Syria. This fragrant resin, which was known to the ancients, is now lost to commerce.—Why is this ? (Liquid Storax : see Case 45.)

No. 224. GUM BENZOIN, derived from *Styrax Benzoin*, Dry. A native of the Malay islands.

Heath Order (*Ericaceæ*) and its near ally, the CRANBERRY ORDER (*Vacciniaceæ*). All woody plants, bearing beautiful flowers, abounding in the temperate parts of the world, and the mountains of intertropical countries. Heaths are remarkably numerous in species at the Cape of Good Hope. In Europe, two or three species of numerous individuals cover very large areas, as the common Ling or Heather (*Calluna vulgaris*, Sal.).

Observe stem of the TREE HEATH (*Erica arborea*, L.), from Teneriffe.

No. 225. *Rhododendron nivale*, Hk. fil. Believed to at CASE tain the loftiest elevation of any Alpine shrub known ; brought 52. by Dr. Hooker from a height of 17,500 to 18,000 feet, in the Eastern Himalaya, where it is, for eight months of the year, buried under many feet of snow. Observe sections of the wood of *Rhododendron* (*R. arboreum*, Sm.).

No. 226. A YAK SADDLE, used in the Himalaya, made of the wood of *Rhododendron Hodgsoni*, Hk. fil.

Epacris Order (*Epacridaceæ*). A group corresponding

CASE 52. very closely to the Heath Order in general appearance and structure, and representing that family in Australia. A few afford excellent berries. Observe—

No. 227. Specimens of *Richea pandanifolia*, Hk. fil., growing in Tasmanian forests, and presenting a peculiarly striking appearance from the huge crowns of waving leaves surmounting a slender naked stem, often 36 feet in height.

Ebony Order (*Ebenaceæ*), consisting principally of tropical Indian trees, several of which afford a heavy and valuable wood. Continued in Case 53.

CASE 53. **No. 228.** EBONY. The best sort is obtained from *Diospyros Ebenum*, Retz, a native of Ceylon; other Indian species yield however a very similar wood. Ebony, characterized by its extremely dark colour and hardness, is (as specimens here exhibited show) the 'heart-wood' (*duramen*) of the tree; the 'sap-wood' (*alburnum*) is white and not durable. The Greeks and Romans were acquainted with Ebony; it is mentioned by Dioscorides, Pliny, etc.

No 229. CALAMANDER WOOD, afforded by another Ceylon *Diospyros* (*D. quæsita*, Thw.), a most beautiful cabinet wood taking a high polish; it is so hard that edge tools can scarcely work it.

Holly Order (*Aquifoliaceæ*). A group of European shrubs and trees, represented in Britain by the Holly. The species are not numerous, though widely scattered over the world.

No. 230. 'YERBA DE MATÉ,' or PARAGUAY TEA, the leaves of *Ilex paraguayensis*, St. Hil., and allied species (according to Mr. Miers): in the province of Paraguay and Brazil cultivated to a great extent. The leaves are scorched and dried, while still attached to the branches brought in by the collectors; they are then beaten, separated, coarsely ground by rude mills, and packed in skins and leathern bags. The leaves are infused in small teapots, of which several forms are here shown, and the tea imbibed either from the spout or by

No. 231, a 'BOMBILLA,' or tube with wire network or perforations at the bottom. The consumption of Maté in South America is enormous; upwards of five millions of pounds, it is said, are annually exported from Paraguay alone. On a lower shelf are exhibited two packages of Paraguay Tea, one made of the skin of the 'great ant-eater.'

No. 232. Wood of the HOLLY (*Ilex Aquifolium*, L.), the favourite European evergreen. The hard white wood is used in making Tunbridge ware, for the 'stringing' or lines in cabinet

work, calico-printers' blocks, etc. 'Bird-lime' is the juice CASE of Holly-bark, extracted by boiling, mixed with a third 53. part of nut-oil.

Sapodilla Order (*Sapotaceæ*). Mainly trees and shrubs CASE of tropical countries; frequently abounding in a milky juice. 54. Several species afford excellent fruits.

No. 233. BALATA. The inspissated juice of *Mimusops globosa*, Gærtn. Introduced from British Guiana as a substitute for Gutta-Percha.

No. 234. SHEA BUTTER, from the seeds of *Butyrospermum Parkii*, Kotschy, growing in Western Africa: likely to become a valuable import for the manufacture of candles and soap.

No. 235. Fruit and seeds of *Butyrospermum Parkii*, Kotschy. Note also sections of the wood upon a lower shelf.

No. 236. Vegetable BUTTER, expressed from the kernels of CASE the seeds of *Bassia butyracea*, Rxb., a tree of Northern India. 55. It is said to make excellent soap, and to burn without smoke or smell.

Observe portion of the Stem of the 'MASSARANDUBA,' or 'Cow-TREE' of Parà; the milk, resembling good cream in consistence, exudes slowly from the wounded bark. It is too viscid to be a safe article of diet. [This species is not determined. Specimens in flower are requested.]

No. 237. STAR APPLE, fruit of *Chrysophyllum Cainito*, L., growing in the West Indian Islands and South America.

No. 238. Branches, with fruit, of *Argania Sideroxyylon*, R.S., a shrub growing in Morocco. The pulp of the fruit is eaten by cattle; from the kernels *Argan Oil*, resembling Olive Oil, is expressed.

No. 239. Specimen of ARGAN OIL.

Case 56, devoted to specimens of GUTTA-PERCHA.

CASE

No. 240. Dried specimens of *Isonandra Gutta*, Hk., the 56. inspissated juice of which constitutes the Gutta-Percha imported from Singapore and the Malay Islands.

Specimens of crude Gutta-Percha are exhibited, from Singapore and Borneo, with a great variety of articles, applied to all sorts of purposes, manufactured from it. 29,935 cwts. of Gutta-Percha were imported in 1874.

[Allied species of *Sapotaceæ* grow in the East Indian Islands, Madagascar, and Guiana, affording a milky juice similar to Gutta-Percha. Specimens of such, in flower, with their respective products, are requested.]

Note a few specimens of the wood of members of the MYRSINE CASE ORDER, growing specially in warm, equable climates, agreeing 57.

CASE closely in structure with the Primrose and Cowslip, excepting
57. in their woody stems : also samples of oil, yielded by the fragrant JASMINE ORDER, are contained in this cabinet.

Olive Order (*Oleaceæ*). A family characterised by opposite leaves, and flowers with two stamens, natives of temperate latitudes ; represented by the Ash in Britain.

No. 241. INSECT WAX, from China, secreted by *Coccus Pe-la*, Westw., upon the branches of *Fraxinus chinensis*, Rxb., and probably other trees.

No. 242. MANNA, the concrete, sweet juice of the Manna Ash (*Fraxinus Ornus*, L.), growing in Sicily and Southern Italy. It is obtained from incisions in the bark, made in summer and autumn.

Note specimens of the wood of the Common Ash (*Fraxinus excelsior*, L.), the toughest and most elastic British timber, greatly valued by the cart- and wheel-wright, cooper, machine-framework and agricultural implement makers. In request in olden time for spears.

CASE **No. 243.** Branches of the Olive-tree (*Olea europæa*, L.),
58. the emblems of peace and plenty. A tree of Syria and Greece, naturalized abundantly on the shores of the Mediterranean, the South of France, and Spain. Valued from a remote period for the sake of the oil obtained by pressure from the pulp of its fruit. It is frequently mentioned in the Sacred Writings.

No. 244. ROSARIES made of the wood and seeds of the Olive from Jerusalem.

No. 245. Samples of OLIVE OIL, imported from Italy, Spain, France, Turkey, the Ionian Islands, etc. 22,628 tuns were imported in 1874. Castile soap is made of olive oil and soda ; soft soap, the oil with potash.

Observe under the MUSTARD-TREE ORDER, a very small tribe of doubtful affinity,—

No. 246. Sections of *Salvadora persica*, L., supposed by Dr. Royle to be the ' Mustard-tree ' mentioned in the New Testament. Considerable doubt attends the determination. *Salvadora* grows from Syria eastward to India, and even down to Ceylon.

Asclepias Order. (*Asclepiadaceæ*), represented in hot-houses by the fleshy-leaved *Hoyas* and other beautiful species. The *Asclepiads* are especially tropical, many of them African and Indian twining shrubs, frequently with a milky juice. The structure of the flowers is very anomalous.

CASE **No. 247.** YERCUM FIBRE, obtained from *Calotropis gigantea*,
59. Br., common in waste places in India. The plant affords also

important native medicines employed in cutaneous affections, **CASE** etc. Remark specimens of the *seeds* of Asclepiads, showing 59.
the beautiful crest of silky hairs which usually surmounts them.

No. 248. INDIAN SABSAPARILLA, the root of *Hemidesmus indicus*, Br., used medicinally in India.

Dogbane Order (*Apocynaceæ*). In many respects similar to the Asclepiads, and, like them, often with a milky, sometimes very poisonous juice, as in the *Tanghin* (*Tanghinia venenifera*, Poir.). Formerly used in Madagascar as an ordeal in cases of suspected crime or apostasy. The Periwinkle (*Vinca*) of our gardens belongs to the Order.

No. 249. Caoutchouc, from *Urceola elastica*, Rxb., a tree of the East Indian islands, also E. African rubber from a species of *Landolphia*.

No. 250. Edible fruit of *Landolphia florida*?, sent from West Africa by Dr. Baikie's Expedition.

No. 251. DODO CLOTH, made from the fibre of the 'Kpok- **CASE** poka' tree, of West Africa. [Specimens in flower of this tree 60.
are required for its accurate determination.]

No. 252. PADDLE-WOOD, the remarkable buttressed or fluted stem of *Aspidosperma excelsum*, Bth. A tree of Guiana, used for the rollers of cotton-gins, and by the Indians in making paddles.

Strychnos Order (*Loganiaceæ*). Chiefly tropical, bearing opposite, undivided leaves. The Order is eminently poisonous, affording some of the most dangerous drugs known to us.

No. 253. Fruit and seeds of NUX-VOMICA (*Strychnos Nux-vomica*, L.).

No. 254. STRYCHNIA, a powerfully poisonous alkaloid prepared from the seeds of the same species.

No. 255. 'WOURALI' or 'CURARE' of Guiana, prepared from the bark of *Strychnos toxifera*, Schomb., another virulent poison, used by the Indians to tip weapons for war and the chase.

Gentian Order (*Gentianeæ*). A numerous and widely-dispersed family of herbaceous plants, generally with smooth, entire, opposite leaves, and beautifully coloured flowers. They are characterized by a powerful bitterness in every part: hence their use by all nations as febrifugal and stomachic medicines.

No. 256. GENTIAN ROOT (*Gentiana lutea*, L.). Grown in France, Germany, the Alps, Pyrenees, etc.; principally employed as a tonic medicine.

Note also the leaves of British species of the Order, used in rural medicine,—Bogbean (*Menthanthes trifoliata*, L.), and Field Gentian (*Gentiana campestris*, L.).

CASE [Opposite to Case 60 stands a small cabinet, made of Australian woods, containing a named collection of materials used by tanners—astringents, dyes, etc. Most of these are referred to under the Orders to which they respectively belong. Passing to Case 61, at the end of the floor, observe, near the door of the Curator's Office, a second cabinet of Australian construction (chiefly made of the Huon Pine: see Case 93), containing a collection of sections of the stems of undetermined species, showing anomalous modes of growth; also a series illustrating the construction of 'Tunbridge ware,' Scotch snuff-boxes, and 'checked ware,' (chiefly made of Sycamore wood,) the construction of violins, etc., as well as a valuable series of materials, fruits, etc., from the ancient Pile dwellings in the Swiss lakes.

Numerous coloured drawings of Rhododendrons, from Dr. Hooker's 'Rhododendrons of Sikkim-Himalaya,' are suspended upon the adjoining walls.]

CASE Under the small tribe of *SESAMUMS* (*Pedaliaceæ*), observe—
61. No. 257. Seeds of *Sesamum indicum*, DC., an annual, cultivated in warm countries, India, China, Africa, and America, for the sake of the valuable oil expressed from the seed. It is 'the Oil' of India, where it is universally used in cooking, anointing, for soaps, etc. In England used chiefly in soap-making, and to burn in lamps.

No. 258. Oil of *SESAMUM*, or GINGELEY OIL.

No. 259. Remarkably armed fruit of *Martynia diandra*, Glox., and

No. 260. Yet more strange fruit of the GRAPPLE PLANT (*Harpagophytum procumbens*, DC.), from the Cape of Good Hope.

Trumpet-flower Order (*Bignoniaceæ*), characterized by twining or climbing stems, often bearing divided leaves and magnificent flowers. They are mainly intertropical.

No. 261. The pod-like fruit of an Indian species of *Bignonia*.

No. 262. Red Pigment, prepared from the leaves of the CHICA (*Bignonia Chica*, Hb.). Used by the Indians of South America in the adornment of their persons.

Note the beautiful membrane-like wing, often of curious microscopic structure, surrounding the seeds of several species of the Order.

Under the closely allied tropical group, the 'CALABASH ORDER,' observe numerous *Calabashes*, the shells of the fruit of *Crescentia Cujete*, L., a tree of the West Indies and South America, applied to various domestic purposes, and often carefully carved or painted.

No. 263. A carved CALABASH CUP of the ancient Incas, CASE dug up at Cusco, in the Peruvian Andes, by the Governor of 61. Pasco, in 1843.

No. 264. Woody fruits of species of *Kigelia*, from the Mauritius, Abyssinia, etc.

Bindweed Order (*Convolvulaceæ*). Usually twining herbs or shrubs, with handsome plaited corollas, abundant all over the tropics. Represented in Britain by the common Bindweeds. The roots commonly possess an acrid and purgative juice.

No. 265. SCAMMONY, a gum-resin obtained from the roots of *Convolvulus Scammonia*, L., growing in Asia Minor and Syria. Employed as a purgative medicine.

No. 266. 'SWEET POTATO.' The root of *Batatas edulis*, Chy. Commonly and very extensively cultivated in tropical countries, although not known to have been collected in a wild state. It is believed by M. A. de Candolle to be of American origin. The root contains much starch and saccharine matter.

No. 267 JALAP, the root of *Exogonium Purga*, Bth., a well-known medicine, named from Xalapa, a city of Mexico, near to which the plant grows.

Observe the BORAGE ORDER (*Boraginaceæ*). Rough leaved plants, with one-sided flower-spikes; growing in temperate countries, especially around the Mediterranean. The roots of some species afford dyes, as—

No. 268. ALKANET-ROOT (*Alkanna tinctoria*, L.), from the shores of the Mediterranean. It yields a red dye, used to stain furniture, etc. Some of the *Cordias*, allied to the Borage Order, afford a tolerable fibre.

Under the DODDER ORDER (*Cuscutaceæ*), a tribe of the CASE Bindweeds, observe mounted specimens of *Dodder* (*Cuscuta* 62. *Epithymum*, L., *C. Trifolii*, Bab., *C. Epilinum*, Weihe, etc.), leafless twining parasites, with small clustered flowers, growing upon and destroying common clover, flax, etc. Three species grow in Britain.

Nightshade Order (*Solanaceæ*). A large and widely distributed group of herbs and shrubs, most abundant between the tropics, characterized by dangerous and narcotic properties. Familiar representatives are the Potato, Tomato, and Tobacco.

No. 269. TOMATOES, the fruit of *Lycopersicum esculentum*, Mill. A plant probably of Mexican or South American origin; commonly cultivated as an esculent.

No. 270. CAPSICUMS, the acrid and biting fruit of *Capsicum annum*, L., and allies, cultivated in India, Africa, and warm

CASE parts of America, Spain, etc. Cayenne pepper, the well-known
 62. pungent condiment, is the ground seeds of one or more species of *Capsicum*.

The remainder of this Case, and part of Case 63, is devoted to the *Potato* (*Solanum tuberosum*, L.), our most important esculent, and various preparations from it, including Messrs. Chollet's dried compressed potatoes; British gum, an altered condition of potato starch, used for postage-stamps; starch, or 'English arrowroot,' etc.; also models of numerous cultivated varieties of the tuber. Observe—

No. 271 Plant of Potato, showing the tubers to be an altered (thickened) condition of subterranean stems.

CASE **No. 272.** An analysis of one pound of Potatoes, with the
 63. constituent water, charcoal, starch (2 oz. 11 dwt. 4·8 grs.), caseine (6 dwt. 9·6 grs.), etc., prepared by Professor Henslow.

No. 273. DEADLY NIGHTSHADE (*Atropa Belladonna*, L.), A dangerous powerful narcotic poison, usefully employed in medicine. It is an herbaceous plant, with solitary, lurid flowers, and violet-black berries, on short stalks, springing from the bases of the rather large ovate leaves. Found in waste places, often near old castles and ruins, in England and on the Continent.

No. 274. HENBANE (*Hyoscyamus niger*, L.). An annual viscid and hairy weed, growing in waste places about villages, with a dingy yellow flower, veined with purple. Also a dangerous poison.

No. 275. THORN APPLE (*Datura Stramonium*, L., and allied species), a poisonous narcotic.

The remainder of this Case, as well as the whole of Cases 64 and 65, are devoted to TOBACCO, the dried leaf of species of *Nicotiana* (principally of *N. Tabacum*, L., *N. rustica*, L., and *N. persica*, Dun.), all, with good ground, believed to be of American origin. By far the greater proportion of the Tobacco consumed in the United Kingdom, is the produce of the United States. From Cuba, the northern provinces of South America, Manilla, etc., further supplies are obtained. Exhibited here are various commercial conditions of the leaf,—cut Tobacco, Cigars, Snuff, etc. The peculiar and characteristic narcotic principle of Tobacco, is developed in the leaf after it is collected, by a fermentative process, promoted by moistening it with syrup or brine. Note in Case 65—

No. 276. Specimens of ENGLISH GROWN TOBACCO.

In 1874, no less than 47,075,875 pounds of Tobacco were entered for home consumption in the United Kingdom; the total import, the same year, exceeding eighty-two millions of pounds

No. 277. A mounted specimen of BROOM-RAPE (*Orobanche*), CASE showing its parasitism on Clover. It belongs to a small Order 66. (*Orobanchaceæ*), characterized by parasitical habit, brown colour, and absence of other than mere scale-like leaves.

A few of the products of the FIGWORT ORDER (*Scrophulariaceæ*), a numerous family, with a wide distribution, are here exhibited. But few are prominent in economic use. Several are highly valued as ornamental flowers, as *Calceolaria*, *Pentstemon*, and *Paulownia*.

No. 278. FOXGLOVE (*Digitalis purpurea*, L.). A tall and handsome plant, frequent in hedges in Britain. A powerful poison.

Labiata Order (*Labiataæ*). A large and well-marked group of about 2300 species, prevailing in dry situations in the warmer temperate regions. Marked botanically by the four-cornered stem, opposite, dotted leaves, whorls of lipped (labiate) flowers, often of great beauty, as in the *Salvia*, and a deeply four-lobed dry fruit. The order is destitute of hurtful properties. Many species are highly fragrant and aromatic, as Sage, Pennyroyal, Lavender, Peppermint, Marjoram, etc., specimens of which, with many essential oils, are here exhibited.

No. 279. PATCHOULI, the essential oil of *Pogostemon Patchouli*, Pell, a plant of India. A powerful perfume, now little used.

The remainder of Case 66 and part of Case 67 contains principally specimens of herbs in domestic use, belonging to the Labiate Order.

Vervain Order (*Verbenaceæ*), commences and is continued CASE in cases 67, 68. It is nearly allied to the *Labiates* in structure and essential properties. Many species in the tropics are large trees, as the Teak of India (*Tectona grandis*, L.), one of the most useful timber-trees, for ship and railway-carriage building.

No. 280. TEAK, quite sound, from Salsette in Bombay, supposed to be 2000 years old.

Observe the Fiddle-wood of Jamaica (*Citharexylon*).

A few products afforded by the ACANTHUS ORDER (*Acanthaceæ*), — a tribe of plants chiefly tropical, including, besides many weeds, some very beautiful hothouse species, also products of the Primrose and Leadwort Orders, are contained in this Case.

The Orders which follow, and which are continued on the Ground Floor, are marked by flowers of comparatively simple

CASE structure, destitute generally of a corolla, and often 'imperfect,' 67, 68. *i.e.* with stamens or with pistil only.

Under the Poke-weed Order (*Phytolaccaceæ*), observe—

No. 281. Sections of the stem of *Phytolacca dioica*, L., a beautiful tree of South America, introduced into Spain, where it is planted to shelter public promenades.

CASE **Goosefoot Order** (*Chenopodiaceæ*). A group of herbaceous, weed-like plants, with insignificant flowers, growing in waste places all over the world; least numerous in hot climates. Some, as Spinach and Orach, are used as pot-herbs.

No. 282. QUINOA. The farinaceous seeds of *Chenopodium Quinoa*, Willd., a chief article of food on the slopes of the Andes of Chili, Peru, and Central America.

No. 283. Models of varieties of BEET-ROOT, red and white, of market gardens. All forms, originated under cultivation, of *Beta vulgaris*, L.

No. 284. SUGAR from BEET-ROOT. Extensively manufactured, principally in France and Central Europe, competing with the product of the Sugar-cane. [Mus. No. II. Case 34.] One ton of Beet-root is said to afford about 100 pounds of raw, or 55 pounds of refined sugar.

No. 285. MANGOLD WURZEL, the root of a cultivated variety of the Beet (*Beta vulgaris*, L.), an herb growing wild on the coasts of Europe and West Asia, etc. Models of sorts used by farmers.

Buckwheat Order (*Polygonaceæ*). Mostly herbaceous plants, marked by the membranous sheathing base of the stalk of their alternate leaves. Widely diffused; many are common and troublesome weeds, as the Dock and Knotgrass.

No. 286. MEDICINAL RHUBARB. The root of *Rheum officinale*, Baill. This plant is cultivated in South Eastern Tibet for its medicinal root, it is supposed also to grow in parts of Western and North Western China, from whence supplies of Rhubarb are derived. It is not clear, however, whether the rhubarb of commerce is obtained exclusively from this plant.

Specimens of Medicinal Rhubarbs; with flower and leaf of the plants affording them, gathered by an eye-witness of their identity, would throw some light on this subject. 'Rhubarb' of our gardens is the acid leaf-stalk of species of the same genus (*Rheum*).

No. 287. BUCKWHEAT (*Polygonum Fagopyrum*, L.). Long cultivated on the continent of Europe, and generally in temperate countries, for its farinaceous seeds, from which an excellent bread is made. Often planted in Britain for feeding game and

poultry. Its native country is scarcely determinable, though **CASE** probably Russia or Western Asia. 69.

The Collection is continued on the

GROUND FLOOR,

Round the corner to the left on reaching the bottom of the stairs.

Laurel Order (*Lauraceæ*). Fine trees, principally of **CASE** cool islands and mountain slopes within the tropics. But one 70. species, the 'Sweet Bay Laurel,' is native of Europe. The stamens are remarkable from the mode in which their anthers open, by little valves or doors, as in the Barberry.

Observe sections of the wood of various Laurels, chiefly of Teneriffe and Madeira, in which islands they form magnificent evergreen forests.

No. 288. Leaves and Fruit of the SWEET BAY (*Laurus nobilis*, L.). The classic Victor's Laurel, sacred to Apollo. A South European shrub. The aromatic leaves are employed on the Continent in cookery. From the berries a green odorous oil is obtained.

No. 289. Wood of the GREENHEART (*Nectandra Rodiæi*, Schk.), a remarkably hard timber, of British Guiana, classed among the first eight woods at Lloyd's.

No. 290. AVOCADO PEAR, fruit of *Persea gratissima*, Gært. Grown in tropical America, West Indies, (where it is much esteemed,) and the Atlantic islands. Note also the wood of this plant.

No. 291. SASSAFRAS BARK and WOOD, the produce of *Sassafras officinale*, Nees, a fine tree of the United States. Used **CASE** 71. in medicine as a sudorific.

No. 292. CAMPHOR, obtained, by distillation, from the wood of *Cinnamomum Camphora*, Nees et Eb., a tree of Japan and China. The root, trunk, and branches, broken up, are heated with water, in closed vessels, the volatilized Camphor being sublimed upon Rice-straw. It is further refined on its arrival in Europe. [See also *Sumatra Camphor*, Case 9, No. 37.]

No. 293. CINNAMON, the bark of *Cinnamomum zeylanicum*, Nees, a tree of Ceylon. Specimens of unbarked branches, affording the different qualities of this valuable spice, with the instruments used in peeling it.

Upon adjoining shelves are specimens of the Cassia barks of commerce, '*Cassia lignea*' and '*Cassia vera*.' [It is probable that these barks may be afforded by several distinct species. Specimens of any Cassia bark, with leaves and flower of the

CASE tree affording it, also of the plant yielding '*Cassia buds*' of commerce, a native of Cochin China, would be of value.]

Of Cinnamon, 1,204,622 pounds were imported in 1874.

CASE Under the small group of 'Plume Nutmegs,' including but
72. some four or five species, very similar in some respects to the Laurels, and more or less fragrant, note—

No. 294. SASSAFRAS BARK, of Tasmania (*Atherosperma moschata*, Lab.), used in remote parts of the colony as Tea. It affords an essential oil.

Nutmeg Order (*Myristicaceæ*). Trees confined exclusively to tropical India and America: often characterized by their red viscid juice. The aromatic qualities common to many of the group are especially marked in—

No. 295. NUTMEGS, the seeds of *Myristica moschata*, Thb. A beautiful tree of the Moluccas, scattered also in other islands of the East Indian Archipelago. The Nutmeg is contained within a fleshy pulp, which opens when matured.

Immediately enveloping the Nutmeg is the shell, outside which is an irregular fibrous-like network (aril), of a beautiful red colour when fresh,—this is 'Mace.' Specimens preserved in fluid show the entire fruits, some of which are partly open, exhibiting the shell of the nutmeg and the 'Mace' covering it.

No. 296. Concrete OIL OF NUTMEG, obtained in the Moluccas, from the seeds, by heat and pressure. Other species allied to *M. moschata* yield inferior qualities of Nutmeg.

Protea Order (*Proteaceæ*). Abounding in New Holland and at the Cape, with a few outlyers in India and South America. Termed *Proteaceæ* from the extraordinary diversity in structure of their often beautiful inflorescence and of the fruit. They do not furnish many useful products. The wood, which seldom reaches a large size, is prettily marked by its peculiar 'silver grain.' Numerous specimens are exhibited in this Case, also in Cases 73, 74.

CASE Observe the wood of *Protea grandiflora*, Thb., and 'Silver
73, 74. Wood' (*Leucadendron argenteum*, R. B.) both Cape species.

Oleaster Order (*Elæagnaceæ*). Consisting of a few trees or shrubs with their leaves more or less covered with minute silvery scales.

No. 297. TREBIZONDE DATES, the fruit of *Elæagnus orientalis*, L.f., used in Persia as dessert.

No. 298. Berries of *Shepherdia argentea*, Nutt. A North American shrub. The mealy pulp of the berries is eaten by the Cree Indians.

Spurge-Laurel or Lace-bark Order (*Thymelaceæ*). CAS
A family of shrubby plants, with remarkably tenacious inner 75.
bark (*liber*) and caustic juice, represented in our gardens and
greenhouses by the *Mezereon*, *Pimelea*, etc. This Order is con-
tinued in Case 76.

Two compartments of this cabinet are devoted to specimens CAS
of the fibrous bark of *Daphne papyracea*, Wall., an Indian plant, 76.
with paper made from it, of various qualities, and in different
stages of manufacture. This and *Edgeworthia Gardneri*, Meisn.,
are two of the Himalayan species affording paper-fibre. *Daphne*
paper is in common use in north-western India for all impor-
tant documents. It is extremely strong and durable. The
finer qualities are well suited for engravings.

No. 299. Stem, with the bark-layers partly turned back,
of the JAMAICA LACE-BARK (*Lagetta lintearia*, Lam.), a tree of
from twenty to thirty feet. The lace-layer is carefully re-
moved through considerable lengths of the stem, and made up
in various ornamental articles,—collars, purses, etc.

Under the *Eagle-woods*, a section of the *Lace-bark* Order,
observe—

No. 300. EAGLE-WOOD or LIGN-ALOES, imported into Syria
through Arabia. Probably the produce of *Aquilaria Agallocha*,
Roxb., a tree of south-eastern Asia, and perhaps identical with
the 'Aloes' of Scripture.

Under **Sandal-Wood Order**, which is continued in Case
77, note—

No. 301. SANDAL-WOOD afforded by an Indian tree (*Santa-* CAS
lum album, L.). Fragrant, and used to burn as incense in temples 77.
and private houses.

No. 302. Chinese JOSS-STICKS, in part made of Sandal-
wood.

Observe, under the *Birthingwort* Order, specimens of South
American 'Guaco,'—the root of one or two species of *Aristo-*
lochia, possessing considerable repute as a cure for the bite of
serpents.

Note also the remarkably large flower of *Aristolochia*
Goldieana, Hk. f., from western tropical Africa.

Spurge Order (*Euphorbiaceæ*). A large family, consist-
ing of from two to three thousand species, exhibiting great
variety in floral structure, which is very imperfectly represented
by our British Spurges. The order is widely diffused, most
abundant towards the Equator, especially in South America.
They are characterized by a milky juice, which is often dan-
gerously poisonous. Several species afford invaluable medicines :

CASE some, after the removal of their venomous juice, yield excellent
77. *farina*.

No. 303. BOXWOOD (*Buxus sempervirens*, L.). A well-known evergreen tree of South and West Europe, growing in some wild-like situations in Britain, but perhaps introduced. Its dense, compact wood is admirably suited for the use of wood-engravers, for graduated scales, etc.

Note the model of a frigate in Box-wood, from a draft by Sir John Henslow, chief Surveyor to the Navy: from this model nine vessels were ordered to be laid down in 1793-4. Presented by Professor Henslow.

No. 304. AFRICAN TEAK (*Oldfieldia africana*, Bth.). A valuable shipbuilder's timber, imported from the West Coast of Africa. [True Teak, see Case 67.]

CASE **No. 305.** The red powder rubbed off the fruit-capsules of
78. *Mallotus philippinensis*, Muell. (*Rottlera tinctoria*, Rxb.). It is the Kamala dye of India, used to dye silks yellow; also employed in medicine as a vermifuge.

No. 306. TALLOW from the seeds of *Stillingia sebifera*, Michx., largely collected in China for candle-making. The seeds, which are enveloped in the 'tallow,' are steamed, beaten, and sifted. The coarse tallow thus obtained is strained through a cylinder of twisted straw. The candles are usually dipped in wax,—owing to the 'tallow,' becoming soft in warm weather. For festivals they are made very large, and ornamented.

No. 307. CANDLE-NUT OIL, from the seeds of *Aleurites triloba*, Forst. The seeds, strung upon a stick, are burnt as candles in the Sandwich Islands.

No. 308. Fruit of SAND-BOX TREE (*Hura crepitans*, L.). The valves of the fruit separate with much violence when mature and dry.

No. 309. CROTON OIL, expressed from the seeds of *Croton Tiglium*, L., a shrub of India and the Indian islands. A powerful purgative; employed externally as a rubefacient.

No. 310. CASTOR OIL, obtained by pressure, either with or without some degree of heat, from the seeds of *Ricinus communis*, L., a native originally of India. It is now scattered widely through tropical and warm countries. Known from antiquity as a valuable laxative medicine.

No. 311. TAPIOCA. A very pure form of Starch, which settles from the water employed to wash Cassava-meal. It is granulated upon hot plates. A close imitation of Tapioca is prepared from *Potato Starch*.

No. 312. CASSAVA or MANDIOCCA Meal, obtained from the CASE root of two species of *Manihot* (*M. utilissima*, Pohl, and *M. Aipi*, Pohl,—*Jatropha*, Linn.), the former, Bitter, the latter, Sweet Cassava.

The juice of 'Bitter Cassava' is highly poisonous. Cassava is grown chiefly in Brazil, Peru, and on the African coast,—forming a main article of native food. The roots of 'Bitter Cassava,' which are often large, weighing from thirty to forty pounds, contain much farinaceous matter, separated from its venomous juice by careful washings, after being grated.

No. 313. CASSAVA biscuits.

No. 314. MANDIOCCA-STRAINERS. Long, cylindrical, plaited baskets in which the grated pulp is put after washing and thoroughly drained.

No. 315. MANDIOCCA-GRATER, studded with particles of granite, secured in the tough wooden frame by the viscid juice of *Couma dulcis*, Aubl., one of the Dogbanes.

The remainder of this Case is devoted to CAOUTCHOUC, or INDIA-RUBBER.

No. 316. Specimen of *Hevea* (*Siphonia*) *brasiliensis*, Müll. Arg., affording the best Caoutchouc, exported from Pará in Brazil. The juice is obtained by incisions cut through the bark; it falls freely from any wound. The stiffening milky juice is plastered over bottle-shaped clay moulds, the clay being removed, when sufficiently coated, by washing. Other species of *Hevea* yield juice abounding in Caoutchouc of various qualities.

Many of the numerous applications of Caoutchouc are here illustrated by a large series of specimens presented by Messrs. Hancock and Macintosh. [Other Caoutchoucs are afforded by *Ficus*, Case 84, and *Urceola*, Case 59. In Central America by *Castilloa elastica*, Cerv., Case 82.]

The total importation of Caoutchouc into the United Kingdom in 1874 amounted to 127,497 cwts.

Part of Case 79 is devoted chiefly to undetermined fruits and CASE woods of the Spurge Order. 79.

Pitcher-plant Order (*Nepenthaceæ*). A small but very extraordinary group of South-eastern Asia, presenting several botanical anomalies. Especially remarkable from the prolonged midrib of the leaf, which is hollowed in the form of a pitcher and surmounted by a lid-like expansion. 'Pitchers' of several species are exhibited.

Nettle Order (*Urticaceæ*). An important group represented in almost every climate by trees or herbs bearing rough

CASE leaves, often formidably armed with stinging hairs. The economic value of the 'Nettle Order' depends chiefly on the tenacious fibre of the bark. A few species are used in rustic medicine and cookery. The sting of some East Indian species is dangerous, occasioning great and long-continued suffering.

The common Nettle, the young tops of which are used as a pot-herb, represents the Order almost everywhere in Europe.

No. 317. CHINA-GRASS (*Bœhmeria nivea*, H. and A.), a Nettle of China, India, and the Indian islands, affording the valuable RHEA fibre. Specimen fabrics made of it are here exhibited. Other Indian species (including certainly *Maoutia Puya*, Wedd., and *Girardinia heterophylla*, Decn.) afford a fibre used for cloth, sails, cordage, fishing-nets, etc., in India.

[Specimens of Indian Nettle-cloths, accompanied by dried examples of the plants affording the fibre, would be valued.]

CASE One compartment of case 80 contains chiefly cordage, cloth, etc., prepared from undetermined species of the Order.

No. 318. Parasol-cover made of the fibre of the COMMON NETTLE (*Urtica dioica*, L.).

Hemp Order (*Cannabinaceæ*). Closely allied in all respects to the Nettle Order, of which it may be regarded as a section. The most important species is Hemp (*Cannabis sativa*, L.), cultivated in cool climates for its invaluable fibre; in tropical India, etc., for the narcotic resin exuded by the leaves and stem. Hemp grows wild in Northern India and temperate Asia. It was cultivated by the Greeks and Romans, but the Egyptians and Hebrews appear to have been unacquainted with it.

No. 319. GUNJA and

No. 320. BHANG, the former, the dried flowering branches, the latter, the leaves and capsules of Hemp, cultivated in the warm parts of India, where an intoxicating resin is secreted by the plant. 'Gunja' is usually smoked, 'Bhang' infused and drunk in water, etc. *Hashish*, or *Hachich*, is a preparation of the resinous leaves used as an intoxicant by Arab tribes.

No. 321. CHURRAS, the gum-resin of the Hemp-plant. Employed in medicine.

No. 322. HEMPSEED OIL.

Specimens of Indian, Russian, Prussian, Spanish, and Italian Hems, are exhibited, with Hempen cordage, etc., from the Royal Dockyards. The separation of the fibrous bark of the stem is brought about by soaking in stagnant water. The preparation of the fibre is quite similar to that of Flax (page 19).

No. 323. Samples of 'HOPS' used by English Brewers; the dried heads of fruit of *Humulus Lupulus*, L. Remarkable

among the great 'Nettle-tribe' for its twining stem. A native CAS
of Europe, Russian Asia, and perhaps of England. Cultivated 80.
over several centuries in Northern Europe, from the period of
the Celts and old Germanic nations, for the sake of its odorous
and resinous cones used in brewing.

Bread-fruit Order (*Artocarpeæ*). A group of tropical CAS
trees or shrubs closely related to the 'Nettles,' marked by a 81.
milky juice and the large scales (stipules) at the base of each
leaf-stalk, which as in the 'Fig Order,' fall and leave a ring-
like scar.

No. 324. BBEAD-FRUIT (*Artocarpus incisa*, L.). A staple
food of the South Sea Islanders. Introduced into the West
Indies. Observe biscuits, etc., made of the 'Bread-fruit.'

No. 325. JACK-FRUIT (*A. integrifolia*, L.). Grown from
time immemorial in Southern Asia. The fruit attains an
enormous size. Certain varieties are highly esteemed as an
article of food by the natives of India. The name 'Jack' is
derived from the Sanscrit name of the fruit, 'Tchackka.' The
wood is valuable for furniture.

In this Case are specimens of Caoutchouc from Central CAS
America, the produce of *Castilloa elastica*, Cerv. 82.

No. 326. LETTER OR LEOPARD-WOOD of Central America
(*Piratinera guianensis*, Aubl.).

No. 327. UPAS. Concrete juice of *Antiaris toxicaria*,
Lesch., a Javanese tree, respecting which the most fabulous
stories have been circulated of its extremely poisonous character.
The juice is however a virulent poison, and is said to be used
by Javanese tribes to tip their arrows

Observe the remarkable 'sacks' exhibited in this case, made
without seam, of the bark of *Lepurandra* (*Antiaris*) *saccidora*,
Nim., by soaking and beating the trunk until the bark is suffi-
ciently loosened to turn inside-out. A portion of the stem re-
mains at the end to serve as a bottom. Made in Western India.

The first compartment of this Case is partially devoted to a CAS
series of Cloths made from the fibrous inner bark of plants of 83.
the Bread-fruit Order.

Fig and Mulberry Order. A tribe closely allied to
the foregoing. Including in the 'Fig' genus, some of the
finest trees of tropical forests. The BANYAN (*Ficus indica*, L.),
remarkable for its enormous extension by means of rooting
branches, is one of the most famous trees of India. The milky
juice afforded by some, yields caoutchouc.

Observe a large collection of TAPA cloths and paper fabri-
cated by the Polynesian Islanders, from the fibrous bark of the

CASE Paper Mulberry (*Broussonetia papyrifera*, Vt.), with club and
 83. shells used in beating and preparing it, also the blocks used to print coloured patterns upon it.

CASE The first compartment of this Case contains an interesting
 84. series illustrating the manufacture and varied uses of paper in Japan, from the barks of *Broussonetia papyrifera*, Vent., and *B. Kämpferi*, Sieb.

No. 328. Portions of branches, rough bark, and bark partially prepared of *B. Kämpferi*, Sieb.

No. 329. Hats, boxes, coats, and various useful and ornamental articles made of the paper.

No. 330. FUSTIC, the hard wood of *Maclura tinctoria*, Nutt. Chiefly imported from the West Indian Islands and Brazil. It is largely used in dyeing yellow.

On the lower shelves of this compartment are shown fruits of the Osage Orange (*Maclura aurantiaca*, Nutt.), a North American tree. Its yellow juice was formerly used by the Indians to disfigure their faces in war time; also Mulberries, the fruit of *Morus nigra*, L., and *Morus alba*, L. Originally native of Asia Minor and the Caspian. Cultivated extensively in Southern Europe and China, both for the fruit and the leaves, which are the food of the silkworm.

No 331. FIGS. The well-known heads of fruit of *Ficus Carica*, L., long cultivated towards the Mediterranean and in West Asia; considered to have been native originally of Asia Minor, Persia, etc., and perhaps of South-east Europe and North Africa. Figs are often mentioned in the sacred writings.

No. 332. SYCAMORE FIG (*F. Sycomorus*, L.). A large Egyptian tree affording a fruit used by the Arabs. Its light wood is said to be almost imperishable, and served to make the cases of Egyptian mummies.

No. 333. CAOUTCHOUC, yielded by *F. elastica*, Rxb., a handsome Indian tree, with firm glossy leaves: often a parlour plant in England. Its milky juice affords about one-third its weight of Caoutchouc.

CASE **No. 334.** LAC. Thread-, Block-lac, etc. A resin produced
 85. by the puncture of a small hemipterous insect abounding in India, upon various trees, but especially the 'Peepul' (*F. religiosa*, L.), *Butea frondosa*, Rxb. (*Leguminosæ*), a *Celtis*, etc.

No. 335. Lacquered work from Scinde and Kashmir.

No. 336. Branch of a *Ficus* with 'tears' of LAC exuding from it

'Elm Order' (*Ulmaceæ*), American and European species of which are valuable timber-trees; the English Elm being espe-

cially suited for works constantly wet. Also the 'Podostemon CASE Order,' moss-like plants growing in fresh water, chiefly in tropical countries. 85.

No. 337. SALT, called *Caarura*, from the Uaupès branch of the Amazon. Prepared from a *Podostemaceæ*.

Pepper Order (*Piperaceæ*). A large family of jointed CASE herbs or shrubby plants, with minute flowers borne on spikes. 85A. They grow in the hottest countries of the globe chiefly tropical America and India. Many species are pungent and aromatic.

No. 338. KAVA BOWL. A much larger example stands near Case 74.

No. 339. KAVA ROOT (*Piper methysticum*, Forst.), used in the Society and South Sea Islands, in the preparation of an abominable beverage, prepared by chewing the root and ejecting the saliva into large bowls, in which it is fermented, etc.

No. 340. PEPPER. Black and white. The fruit of *Piper nigrum*, L., a climbing Indian shrub, cultivated in India, the Indian Islands, and West Africa. 'Black Pepper' consists of the dried unripe berries; 'White Pepper' is the ripe fruit deprived of its rind by macerating. 19,596,843 lbs. of Pepper were imported into the United Kingdom in 1874.

Observe 'Long-Pepper,' the dried unripe fruit-spikes of *Piper officinarum*, C. DC. and *P. longum*, L., Indian shrubs; also 'Cubebs,' dried fruits of *Piper Cubeba*, L. fil., used in medicine.

No. 341. MATICO. The coarse leaves of *Artanthe elongata*, Miq. A Peruvian plant, used as a styptic.

Under the small 'Myrica Order,' note specimens of the wax CASE obtained from the berries of various species of *Myrica* (*M. cerifera*, L., *M. cordifolia*, L., etc.), growing in Central America and the Cape. 85B.

Willow Order (*Salicaceæ*). Well represented by our Sal- lows, Osiers, and Poplars. This order is commenced in Case 85 B, and continued in Case 86 and 87. Observe numerous specimens of the wood of various species, and baskets in different stages of construction, made of the twigs of Osier (*Salix viminalis*, L., *S. vitellina*, E.B., etc.); also Exchequer tallies (formerly made of Hazel, Alder, or Willow), with an account of the mode of using them; Willow plait, Sussex truck-baskets, sabots, clothes-pegs, etc., of Willow wood.

Nut and Hazel Order (*Corylaceæ*). Including some CASE most valuable timber trees,—the Oak, Beech, etc. Very com- 87. mon in the forests of temperate countries; many species of Oak and Chestnut extend to the Himalaya and Indian islands.

CASE The bark and acorn-cups of some Oaks contain an astringent
87. principle.

Observe specimens of OAK timber (*Quercus Robur*, L., and varieties) from various European ports, also of English growth. The collection of wood specimens of European, American, and Asiatic species of *Quercus* is continued in Case 88.

CASE **No. 342.** REFUSE OAK-BARK, from tanyards, used as fuel in
89. South France.

No. 343. ENGLISH 'COPPICE' and other barks, used by tanners.

No. 344. QUERCITRON, the bark of *Q. tinctoria*, L., a useful yellow dye.

No. 345. VALONIA, the Acorn-cups of *Q. Ægilops*, L., imported from Greece and Asia Minor, for the use of tanners and dyers. 26,153 tons of Valonia were imported in 1874.

Note the specimens of OAK-GALLS formed upon the leaves and twigs of Oak, which have been punctured by minute insects (*Cynips*, *Aphis*, etc.). Very valuable as sources of Gallic and Tannic Acids.

No. 346. GALL-NUTS, from the puncture of a *Cynips*, on *Q. infectoria*, Ol., a shrubby oak of Asia Minor. Galls produced on other species are also met with in commerce.

No. 347. GALLIC ACID, obtained from infusion of Gall-nuts exposed to the air.

No. 348. TANNIN, extracted by Ether from Nut-galls. The union of Tannin with the gelatine in the hides constitutes 'Leather.'

The two remaining compartments of this Case are devoted to specimens of Oak of historical interest, Bog-Oak, etc.

No. 349. BOG-OAK, dug up from under the Roman (Hadrian's) wall.

No. 350. Portion of a pile of old London Bridge, in use about 650 years; taken up in 1827.

No. 351. Block from 'Herne the Hunter's Oak.'

No. 352. A block recovered in 1840 from the wreck of the 'Royal George,' sunk in 1782 at Spithead.

No. 353. Series showing stages in the manufacture of the Oak and Elm fasteners used to secure rails to the 'shoes' and 'sleepers' on Railways.

CASE Specimens of Bark, stem-sections, etc., of the Cork-Oak
90. (*Q. Suber*, L.), growing in Spain, South France, and Italy. 'Cork' is the thick, outer bark, which may be removed from the same tree at intervals of six to ten years after it attains an

age of about thirty years. The Cork collected previously is of CASE inferior quality. The bark is heated, loaded with weights to 90. flatten it, and then slowly dried. The operation of removing the Cork does not interfere with the healthy growth of the tree; it is said, rather, to favour it.

Specimens of various Bottle 'Corks,' finished and in progress, are exhibited.

No. 354. 'NUTS,' the well-known shell-fruit of *Corylus CASE* *Avellana*, L., and its varieties. Chiefly imported from Asturias 91. and the Mediterranean provinces of Spain.

No. 355. Wood of the CHESTNUT (*Castanea vesca*, Gært.). A valuable and highly ornamental European tree, attaining, sometimes, an enormous size.

Chestnut cosses furnish, in France, hoops and vine-props.

No. 356. BEECH-OIL, obtained in France from the fruit of the Beech (Beech-mast). Used for food and burning.

No. 357. LAST and BOOT-TREE, models. Usually made of Beech.

No. 358. Wood of the BEECH (*Fagus sylvatica*, L.). A fine forest tree, affording a valuable tenacious and flexible wood.

No. 359. Specimens of the wood of the TASMANIAN MYRTLE (*Fagus Cunninghamii*, Hk.), abounding in the forests of Tasmania; often attaining a height of two hundred feet, with a girth of forty feet.

The lower shelves of the last compartment contain 'Birch bark' (*Betula papyracea*), and its various applications of use and ornament, from Canada, Switzerland, Norway, etc.

No. 360. BREAD made of BIRCH BARK, from north-west CASE America. 92.

Beefwood Order (*Casuarinaceae*). A small group of leafless trees with jointed pendulous twigs. Some of the species afford a wood of extreme hardness, formerly used in the Pacific islands for war-clubs, etc.

Walnut Order (*Juglandaceae*). Important in economic botany, from the value of the timber of two or three species and the fruit of the Walnut and Hickory.

No. 361. WALNUTS, the kernel of the fruit of *Juglans regia*, L. Exported from the South of France. Introduced into Europe from the South of the Caucasus and adjoining parts of Russia.

No. 362. WALNUT OIL, expressed from the kernels. Used as an article of food. Expressed with heat, it is a drying oil, much used in the arts.

CASE No. 363. WALNUT CAKE, remaining after the expression of the Oil ; used for cattle-feeding in the North of Italy.

No. 364. WALNUT WOOD. The chief cabinet-wood of Europe before the introduction of Mahogany.

CASE No. 365. BLACK WALNUT (*Juglans nigra*, L.). The wood much used in the United States for cabinet-work.

No. 366. BUTTERNUT WOOD (*Juglans cinerea*, L.) of the United States.

No. 367. HICKORY NUTS, *Carya alba*, Nutt., and *C. tomentosa*, Nutt., the former species affording the principal supply.

Observe the remarkable structure of the wood, shown in cross sections, of the 'Joint-Firs' (*Gnetum*), a tribe closely related to the Pine Order. Note also the plant, flower- and fruit-cones of *Welwitschia mirabilis*, Hk. f., a remarkable dwarf tree of South-West Africa, discovered in 1859 by Dr. Welwitsch and described by Dr. Hooker in the Transactions of the Linnean Society (vol. xxiv. 1). Fine specimens of these plants are also exhibited in Museum No. III.

Pine Order (*Coniferae*). So called from the heads of fruit being usually arranged in dense cones. The Order is a large and highly important one, consisting of noble timber trees or shrubs, generally with narrow, rigid, and evergreen leaves. The Scotch Fir, Cedar, and Yew, are well-known examples. The wood is characterized by the absence of pores (vessels) and by peculiar disk-like microscopic markings on its cells.

The specimens and products afforded by the Order extend to Case No. 100. In Cases 93 (in part), 94, and 95, a valuable series of CONES is arranged ; also, specimens of the wood and sundry products. The RESINS which abound in and characterize the Order, are exhibited together in Case 98.

Under *Taxaceæ* (a section of the Pine Order) note—

No. 368. YEW (*Taxus baccata*, L.), from Syon House. The favourite wood for the long-bows of olden time. The juicy red cups of the fruit are harmless, but the leaves are very poisonous.

No. 369. Wood of HUON PINE (*Dacrydium Franklinii*, Hk. fil.). A tall Tasmanian tree, suited for planking and boat-building. [A cabinet chiefly made of this wood stands on the 'Middle Floor' near Case 61.]

No. 370. PINE DRIFT-WOOD, brought from the Arctic regions.

Of the true Cone-bearing species, under the genus *Pinus*, marked by needle-like, evergreen leaves, and hard cones with thickened scales, note—

No. 371. SCOTCH FIR (*P. sylvestris*, L.), an important timber-tree, much planted in Britain, and generally distributed through North and Central Europe; affords 'Yellow Deal,' and a large proportion of the 'Tar' used in Europe. 93.

Observe the cones of *P. sylvestris*, L., *P. halepensis*, Mill. (South Europe), *P. Pinaster*, Ait. (France, Italy, etc.), *P. Pinea*, L. (South Europe), *P. pungens*, Lb. (United States), etc.

No. 372. PINE-WOOL, prepared from the leaves of *P. sylvestris*, L., and used for stuffing cushions, felting, etc.

No. 373. SOAP, made from oil obtained from the leaves of the same species.

No. 374. Edible SEEDS of the STONE PINE (*P. Pinea*, L.), strung together as brought to market in Lisbon.

Note Cones of the Himalayan Pines, *P. Gerardiana*, Wall., CASE and *P. longifolia*, Lamb.; the North American—*P. Coulteri*, 93, 94. Don., *P. rigida*, Mill., *P. insignis*, Dgl., *P. Sabiniana*, Dgl., etc.

No. 375. WOOD of the WEYMOUTH PINE (*P. Strobilus*, L.). The most valuable timber fir of North America.

No. 376. PAPER, from sawdust of same.

Under the section or genus *Abies*,—the Spruce-Firs,—with CASE shorter and flatter leaves than true Pines, and the scales of the cones thinner,— 95.

Observe the cones of *A. nobilis*, *A. pectinata*, *A. Douglasii*, etc.

No. 377. NORWAY SPRUCE (*A. excelsa*, DC.). The 'White Deal' of carpenters. Affords Burgundy Pitch.

No. 378. PLANKS of DOUGLAS PINE (*A. Douglasii*, Ldl.), grown in Northumberland.

No. 379. BARK of the HEMLOCK-SPRUCE (*Abies canadensis*, Mx.), employed in tanning.

No. 380. BREAD made of PINE-BARK and Moss, eaten in time of scarcity in Finland.

In this Case are miscellaneous articles made of the wood of CASE the Pine and Spruce,—as toys, fire-lighters, matches, etc. 96. Note the interesting series illustrating the manufacture of children's toys, as carried on in Saxony.

No. 381. MAT, BASKET, ROPE, etc., of Pine-shavings. Used in Sweden.

No. 382. PINE SHINGLES, used in Switzerland to cover walls of houses, overlying each other as tiles.

No. 383. WOOD of LARCH (*Larix europæa*, DC.). Exceedingly strong and durable. Affords Venice turpentine. CASE 97.

No. 384. BARK of the same, used in tanning.

CASE No. 385. CONES of the three forms of CEDAR, from Syria, 97. Himalaya, and Atlas.

No. 386. CEDAR-WOOD (*Cedrus Libani*, Loud., and vars.). Native on the Lebanon and Taurus, and under slightly different forms on the Himalaya (*C. Deodara*, Rxb.) and Atlas (*C. atlantica*, Man.). Emblematic, in the sacred writings, of grandeur and power.

No. 387. Cast of FOSSIL CONIFEROUS CONE (*Pinites macrocephalus*). Lower green-sand, Kent.

The last compartment of this Case contains cones of several species of *Dammara*, also *Cunninghamia sinensis*, Rich., *Sciadopitys verticillata*, S. et Z., etc.

CASE No. 388. CONES of NORFOLK ISLAND PINE (*Araucaria* 98. *excelsa*, Ait.).

No. 389. CHILI PINE (*A. imbricata*, Pav.).

No. 390. BUNYA-BUNYA PINE (*A. Bidwillii*, Hk.).

No. 391. Seeds of same, used as food by the Aborigines of Moreton Bay, Australia.

No. 392. Wood of Norfolk Island Pine, and candlesticks made of the same.

No. 393. *A. brasiliensis*, Lb. South Brazil.

Observe fine specimen of branch of *Araucaria Rulei*.

The last compartment of this Cabinet is devoted to the resinous products of the Pine tribe,—Tar, Pitch, Turpentine, Balsams, and Resins.

No. 394. DAMMAR, COWDI or KAURI RESIN, afforded by *Dammara australis*, Lb., the New Zealand 'Cowdi Pine.' Used in varnish-making. The largest masses are found buried in the soil, in many places far from where the trees now grow.

No. 395. Resin of *D. orientalis*, Don, a giant tree of the East Indian Islands.

No. 396. TURPENTINE. The principal supply is from America, and is obtained chiefly from *Pinus palustris*, Mill. It exudes from wounds made in the trunk, near the ground.

No. 397. STRASBURG TURPENTINE. Rarely seen. From blisters in the bark of *Abies Picea*, Mill.

No. 398. VENICE TURPENTINE, from the Larch (*Larix europæa*, DC.).

No. 399. TAR, from Archangel, Stockholm, etc. Chiefly obtained in Sweden and Russia, from the Scotch Fir (*Pinus sylvestris*, L.), by a process of dry distillation. Billets and roots of the Pine being burned in a closed pit, the Tar exudes, flowing into barrels, which are bunged for exportation as soon as filled.

No. 400. BLACK PITCH. The residuum in the distillation of Pyroligneous Acid from Wood-tar. CASE 98.

No. 401. COMMON FRANKINCENSE, or THUS. A spontaneous exudation from the Spruce (*Abies excelsa*, DC.).

No. 402. BURGUNDY PITCH, obtained also from the Spruce, chiefly in Western Switzerland. So often impure that other and cheaper sorts are usually substituted for it, under the same name, in trade.

No. 403. CANADA BALSAM, from *Abies balsamea*, Marsh., and *A. Fraseri*, Pursh.

No. 404. ROSIN, or COMMON RESIN. The residue after distillation of Oil of Turpentine. The colour depends upon the degree to which the process is carried.

No. 405. JUNIPER BERRIES. The succulent, resinous, and rather sweet fruit of *Juniperus communis*, L., a European and British shrub. Used in Belgium, North France, etc., in the preparation of gin. CASE 99.

No. 406. Stages in the manufacture of pencils.

No. 407. Wood of *Juniperus virginiana*, L., and its variety,

No. 408. *J. bermudiana*, L., both affording the so-called 'Pencil Cedar,' employed in the manufacture of lead-pencils.

No. 409. Cones of *Sequoia* (*Wellingtonia*) *gigantea*, Torr., from the Sierra Nevada, California. A tree has been described 450 feet in height, with a circumference of 116 feet. The oldest trees are not believed, by Dr. A. Gray much to antedate the Christian era.

No. 410. SANDARACH, the resin of *Callitris quadrivalvis*, CASE Vent.; powdered, it is 'Pounce,' used to prepare parchment for writing upon. 100.

No. 411. Vases made of the wood of *Callitris quadrivalvis*, Vent., an Algerian tree; presented by the Prince Jerome Bonaparte.

No. 412. OYSTER-BAY PINE (*Frenela rhomboidea*, Endl.), from Tasmania.

No. 413. CYPRESS-WOOD (*Cupressus sempervirens*, L.). Aromatic, compact, and almost imperishable.

No. 414. Wrapper made of the bark of *Thuja gigantea*, Nutt., a North-west American tree.

Cycas Order (*Cycadaceæ*). A small group of Palm-like shrubs or trees, in the structure and mode of arrangement of the flowers, presenting some analogy with the Pine Order. Natives, mostly, of Mexico, the Cape, and tropical Asia. Fossil cones and a trunk of the Order have been found in the lower greensand, Kent, and at Portland. None are now native in Europe.

No. 415. Cones of *Encephalartos horridus*, Lehm., and—

CASE No. 416. *E. pungens*, Lehm. South African shrubs, with 100. fiercely-armed, spinose leaves. The cones have been ripened in Britain. Living specimens are in the 'Palm-stove.'

CASE No. 417. SAGO. Prepared from the nuts of *Cycas circinalis*, 101. L., in Ceylon and Western India. Much used by the poorer natives. [Sago, see Museum No. II., Case 86.]

No. 418. Sections of wood of *Cycas revoluta*, Thb., showing a cellular pith-like mass traversed by rings and bundles of woody fibre.

Rhizanthæ. Under this head are collected a few most anomalous plants of very different structure, agreeing in the absence of green colour and leaves, and in their parasitism upon the stems and roots of other vegetables.

No. 419. CUPS, used by the Lepchas, Tibetans, etc., made from knots formed on the roots of Oaks, Maples, etc., by the parasitical *Balanophora involucrata*, Hk. fil. Some of these, esteemed antidotes to poison, fetch a great price.

No. 420. CANDLES, made in New Grenada, of the waxy secretion contained in the tissues of *Langsdorfia hypogæa*, Mart. *Balanophora elongata*, Bl. furnishes a wax similarly used in Java.

No. 421. Flowers of *Rafflesia* (*R. Patma*, Bl., and *R. Arnoldi*, Br.). Of the latter, the largest flower in the world, see a model in wax, in a table-case, in Museum No. III.

On the staircase and on the wall-space over the several fire-grates are hung numerous portraits of eminent botanists and travellers. Nearly the whole of this collection was got together by the late Sir W. J. Hooker, and after his death was purchased by the Government for this Museum.

MUSEUM No. II.

The botanical character of the plants represented by the specimens and products in this Museum (exclusive of those in the Table-cases, also Wall-cases of Rooms 4, 9, and 10, which belong to 'Flowerless Orders,' or miscellaneous objects), are chiefly these:—1st. The embryo plant, in the ripe seed, has but one seed-leaf (*cotyledon*, hence called *Monocotyledons*), and the first leaves alternate. 2. The species having woody stems, form isolated bundles of wood which usually do not increase in thickness year by year; once formed, they remain unaltered in diameter, scattered through the pith-like substance of the stem. 3. The parts of the flower are usually in *threes*. 4. The veins of the leaves, excepting in a few Orders, are parallel, or if diverging, not irregularly netted.

The Collections occupy two Floors, commencing in Room No. I., a small apartment on the Upper Floor, near the top of the stairs. The number of each 'Room' is usually affixed above, or by the side of the doorway leading into it. The Cases and objects specified in the Guide are numbered consecutively from Room No. I.

UPPER FLOOR.

ROOM NO. I.

Yam Order (*Dioscoreaceæ*). A group of twining shrubs CASE
with large tubers, together with the following Order, charac- 1.
terized by having *net-veined* leaves; differing in this respect
from most other Monocotyledons.

No. 1. YAMS. The tubers of various species of *Dioscorea*,
cultivated in nearly all tropical countries as important escu-
lents. The tubers abound in farinaceous matter, and often
reach a large size, weighing from thirty to forty pounds.
Their culture is considered to have spread from South-east Asia
and the East Indian islands, where at present *D. alata*, L., is
the most commonly grown.

No. 2. BISCUITS made of the flour of YAMS, from Jamaica.

Sarsaparilla Order (*Smilacææ*). Observe specimens of
the *Sarsaparillas* of commerce.

No. 3. The underground stem (rhizome) of various species
of *Smilax*, growing in South and Central America, Mexico, and
the West Indies. The determination of the species affording
the Sarsaparillas employed in medicine is very difficult. *S.*
officinalis, H. B. K., *S. papyracea*, Poir. (Brazilian), *S. medica*,
Schl. (Mexican), are among the species affording the supply.

[Specimens of the rhizome, with a flowering branch of any
Sarsaparilla-producing *Smilax* would be valued.]

No. 4. CHINA ROOT (*Smilax China*, L.), brought from China CASE
and Japan. 2.

Under the small aquatic order, the 'Frogbits,' widely diffused
over the globe, note—

No. 5. The 'NEW WATER-WEED' (*Elodea canadensis*, Rich.).
This species is abundant in North America, whence it has been
introduced into Britain: within the past sixteen or seventeen
years it has rapidly spread through the canals and ponds of the
United Kingdom, especially in the midland counties, where it
obstructs navigation. Only female plants have been found in
Britain.

Orchis Order (*Orchidacææ*). A large and very remark-
able group, marked by flowers of very irregular and anomalous

CASE form, often of great beauty. It grows all over the world, excepting in very cold and dry regions. In cool climates the species are usually terrestrial, while in the tropics they are generally found growing upon the trunks of trees, etc. (epiphytes). From the beauty and singularity of their flowers, many are cultivated in our hothouses. Few afford economic products.

CASE No. 6. VANILLA. The fragrant fruit of *Vanilla planifolia*, And., collected in Mexico. It is used in confectionery to flavour chocolates, creams, liqueurs, etc. Other allied species of *Vanilla*, growing in South and Central America, afford fragrant fruits, inferior in quality to the Mexican.

Ginger Order (*Zingiberaceæ*). Tropical herbs, with aromatic, creeping, root-like stems (rhizomes), and very irregular flowers. The greater number are East Indian.

No. 7. GRAINS OF PARADISE, the pungent seeds of *Amomum Melegueta*, Rosc., a West African herb; used to give 'strength' to spirits, beer, etc., and in veterinary medicine. [Of allied species affording similar seeds, specimens in flower and fruit, with the leaves, are requested.]

CASE No. 8. CARDAMOMS, the fruit of *Elettaria Cardamomum*, Mat., a perennial herb of the East Indies. Used in flavouring and in medicine. 'Ceylon Cardamoms' are the produce of *E. major*, Sm.

No. 9. TURMERIC, the powdered rhizome of *Curcuma longa*, L., commonly cultivated in India, also in China. It is used as an aromatic condiment in curries, Indian cookery, etc., as a colouring ingredient, and test for the presence of alkalies, which change its colour to a brown.

No. 10. EAST INDIAN ARROWROOT, obtained from the tubers of *O. angustifolia*, Roxb.

No. 11. ZEDOARY. The aromatic tubers of an allied *Curcuma*, used in medicine.

No. 12. GINGER. The root-like stem of *Zingiber officinale*, Rosc., cultivated in the warmer parts of Asia, the West Indies, Sierra Leone, etc. Of this well-known condiment several varieties are known in trade, distinguished by their quality, country of growth, etc. Gingers are either 'coated' with the shrivelled rind, or 'scraped,' having it removed. Ginger is sometimes 'bleached' by chloride of lime, or 'white-washed' with lime and water. 38,750 cwts. of Ginger were imported in 1874.

Specimens of Ginger from the East and West Indies, Africa, etc., are exhibited.

No. 13. PRESERVED GINGER. The young shoots of the **CASE** rhizome, peeled and preserved in syrup. 4.

At the opposite end of the room,—

Case 5 contains baskets and matting made of the large **CASE** ribbed leaves or split stems of certain of the 'Arrow-root **Order**' (*Marantaceæ*); a group very closely resembling the 'Gingers,' growing in hot countries. 5.

No. 14. Mat constructed of strips of the stem of *Phrynium dichotomum*, Rxb., brought from Silhet by Dr. Hooker.

No. 15. Rhizome of the **ARROW-ROOT** plant (*Maranta arundinacea*, L.) of the West Indies; chiefly cultivated in St. Vincent and Barbadoes.

No. 16. West Indian **ARROW-ROOT**, the starch obtained by washing, from the rhizomes of the above.

No. 17. **TOUS-LES-MOIS.** Starch from the tubers of *Canna edulis*, Ker. Commonly used by invalids. The microscopic granules of Tous-les-Mois are larger than those of any other starch used as food.

Plantain Order (*Musaceæ*). A small though highly im- **CASE** portant group of plants, with large sheathing leaves, chiefly 6. tropical. Two or three species afford invaluable fruits (Bananas and Plantains); the leaves yield an excellent fibre. Numerous specimens of Plantain fibre, with matting, cloth, cordage, etc., made of it, are exhibited.

No. 18. **MANILA HEMP**, the fibre of *Musa textilis*, Nees, with many of its applications.

Imported from the Philippine Islands.

No. 19. Cordage, paper, etc., manufactured from **MANILA CASE** **HEMP.** 7.

No. 20. **BANANAS**, the fruit of *Musa sapientum*, Br., a species cultivated everywhere in the tropics, under one or other of its varieties. In India, China, and the East Indian islands, the culture of 'Bananas' dates from extreme antiquity. There is no sufficient evidence of their existence in the New World prior to its discovery.

The variety yielding the 'Plantain' (*M. paradisiaca*, L.) scarcely differs from the true 'Banana.' These fruits are of the greatest importance as food in tropical countries.

No. 21. Flower-spike of the **ENSETE** of Bruce (*Musa Ensete*, Gmel.), from Abyssinia.

No. 22. Fruit of the **TRAVELLER'S TREE** of Madagascar (*Ravenala madagascariensis*, Sonn.), showing the seeds surrounded by a bright blue aril; brought by Mr. Ellis from Madagascar.

ASE Iris Order (*Iridaceæ*), familiar to us in the Yellow Flag-
8. and Crocus. Many beautiful Cape species are cultivated.

No. 23. SAFFRON, the dried stigmas (the trifid orange-coloured tops of the central organ of the flower) of *Crocus sativus*, All. Native in Asia Minor; cultivated in Egypt and South Europe. It is used as a colouring ingredient and for flavouring confectionery.

Observe, under 'Tacca Order,'—

No. 24. Starch from the tubers of *Tacca pinnatifida*, L., and one or two allied species. A most important article of food in the South Sea Islands.

Under 'Amaryllis Order,' a group resembling the 'Lilies,' differing in having the ovary *below* the whorls of the flower (represented by the Daffodil and Snowdrop, also many handsome exotic species (*Crinum*, etc.) grown in plant-houses), note—

No. 25. Fibre of *Agave americana*, L., called 'American Aloe,' with various fabrics made of it. The juice of the *Agave* affords, when fermented, a liquor much used in Mexico, called *Pulque*.

ASE Pine-apple Order (*Bromeliaceæ*). American hard and
9. dry-leaved plants, familiar to us in—

No. 26. PINE-APPLE (*Bromelia Ananas*, L.). Introduced into the tropics of the Old World, where, as in the jungles of India and the West Indies, it has become naturalized.

No. 27. FIBRE from the leaves of the PINE-APPLE.

'Pita,' and other fibres, afforded by species of *Bromelia* (*B. Pinguin*, L., etc.), With articles manufactured from them, are exhibited.

Room No. II.

Grass Order (*Gramineæ*). Familiar to us, clothing our meadows, pastures, and waysides. These, however, feebly represent the gigantic grasses of the tropics, some of which, as the Bamboos, attain a height of 100 feet or more. Of this most important Order, there may be about from 3500 to 4000 species, including all the Cereals—Wheat, Rice, Indian Corn, etc., our most important bread-producing plants. The Order is continued in Room No. III.

ASE Room No. II. is devoted to Bamboos (*Bambusa arundinacea*,
11, Retz, and allies). The stem, entire or split up into fine strips,
12. and the broad leaves, are applied in China, India, and the East Indian islands, to a great variety of purposes. The young shoots are eaten; from the juice a fermented drink is prepared; the

larger jointed stems serve as water-vessels, while very small ones are suspended as ear-rings, etc. Walking-canes, fishing-baskets, blow-tubes and arrows, bowls, curious Chinese ornaments carved out of the Bamboo root-stock, window-blinds, bow and arrow of a tiger-trap, guitar, flute, comb, brushes, cloth, paper, chair, umbrella, etc., are among the sundry articles here exhibited, constructed of Bamboo. Observe in

Case 12. TABASHEER, a siliceous deposit (Silica, 70, Potash and Lime, 30 per ct.), obtained from the joints of the Bamboo.

No. 28 Porcelain cup, covered with split Bamboo of remarkably fine workmanship, from Japan.

Observe, suspended in the passage, a series of Diagrams, explanatory of the structure of flowers, fruits, etc., prepared by Professor Henslow for the Committee of Council on Education, Also a portion of the celebrated 'Dragon-tree' (*Dracæna Draco*, L.), of Orotava, Teneriffe. It was known to be a very ancient tree in 1406, and was destroyed by a gale in 1867.

Room No. III.

The gallery round the principal room of the house, appropriated to the 'Grass Order.'

(To the left, immediately on entering from the stairs.) Various kinds of RICE (*Oryza sativa*, L.), with and without the husk, from India, East Indian islands, Europe, America, etc. This grain furnishes to the human race a larger proportion of food than any other single species. In India, where it is found wild, its cultivation is of the highest antiquity. It is said to have been introduced into China about 4600 years ago. At the present time it is grown in nearly all hot countries, extending to Southern Europe, and into several of the Southern States of America, especially the Carolinas, where some of the finest rice is produced. Of Rice (not in the husk), 7,002,798 cwts. were imported in 1874 into the United Kingdom.

No. 29. Numerous varieties of RICE grown in India, in the husk called 'Paddy.' The Rice of Patna and Arracan command a large sale in the London market. Note also samples from other rice-growing countries.

No. 30. STARCHES manufactured in England from Rice.

Matting, Baskets, etc., made of 'Esparto Grass' (*Machrochloa tenacissima*, Kth.), and perhaps another species, growing in Spain, Italy, North Africa, etc. Used in the time of the Romans for coarse cordage, and now extensively employed for paper-making.

CASE Chiefly devoted to INDIAN CORN, or MAIZE (*Zea Mays*, L.).

15. Native originally of America, of which part is doubtful. Early introduced into the Old World after the discovery of the former, and now a most important culture in the East Indian islands and North Africa. It is grown also in South Europe. 17,683,212 cwts. were imported in 1874.

Numerous varieties are exhibited. Remark—

HAT made of 'HUSK,' the sheathing-leaves of Maize.

No. 31. 'CORNBALL,' made of 'popped' grains of Indian Corn, prepared by heating them on a metal plate. The grains open, exposing their starchy, white contents. They are sweetened and coloured.

No. 32. Monstrous growths of the flowering-spike of Maize.

No. 33. MAIZE from a Peruvian sepulchre.

In passing to Case 16, note a frame containing specimens of woods seasoned by Newton's patent desiccating process.

CASE Case 16 contains chiefly agricultural grasses.

16. Observe—

No. 34. JOB'S TEARS (*Coix Lachryma*, L.). The seeds, surrounded by a hard-shelled involucre, strung upon thread, and sold in Paris for rosaries, at a sou apiece.

No. 35. CANARY-SEED (*Phalaris canariensis*, L.). Mainly used to feed caged birds. The annual consumption is about 200,000 bushels, 9-tenths of which come from Barbary and Turkey, Holland and a few of the English counties supply the remainder. The principal sale is in the manufacturing districts of Lancashire and Yorkshire.

CASE **No. 36.** MILLET (*Panicum miliaceum*, L., *P. italicum*, L., etc.). Cultivated from a very remote period, in India and China. Millets were also grown by the Celts and Germans. The species are ill-understood, and scarcely to be identified.

No. 37. INDIAN MILLET (*Setaria*, spp.).

No. 38. GERO (*Penicillaria spicata*, Willd.). A grain in daily household use on the Niger and Gambia. This specimen shows the mode in which the 'spikes' are secured for transport.

CASE **No. 39.** COMMON REED (*Phragmites communis*, Trin.).

18. **No. 40.** Portion of ceiling from a cottage in Somerset, of reeds and plaster.

Observe specimens of Maram-grass (*Psamma arenaria*, Beauv.); a very valuable sand-binding plant.

No. 41. PROVENCE REED (*A. Donax*, L.). From the South of Europe. The root is used medicinally in France.

No. 42. Flowering-spike of PAMPAS GRASS (*Gynerium argenteum*, Nees). A tall South American grass, cultivated for ornament out-of-doors in Britain. The flower-stems serve for the shafts of arrows. 19.

Agricultural varieties of the Oat (*Avena sativa*, L.). The precise native country cannot now be determined, though probably it is of European or West Asiatic origin. It would appear to have been cultivated by the German races, but not by the Hebrews, Egyptians, Greeks, or Romans. 20.

Continued in Case 21. Note 'Oat-cake' and Norwegian 'Flad-bród,' the latter usually made of Barley-meal, or Barley and Oatmeal mixed. Baked in thin circles over a wood fire. 21.

Cases 22 to 24. Chiefly labelled agricultural grasses and seeds, including Fescues (*Festucæ*), and Meadow-grasses (*Poæ*). Note the stems of the 'Crested Dog's-tail' (*Cynosurus cristatus*, L.), prepared for plaiting, dyed, etc. Also hat, etc., of same. It is a common wild British species. 22, 23, 24.

Case 25. Principally agricultural varieties of WHEAT (*Triticum vulgare*, DC.). Its culture is coeval with the history of agriculture itself. Various passages in the sacred writings mention it. It is said to have been found wild in Asia Minor, but doubt must always attach to the place of its original nativity. 25.

Observe—

No. 43. PAPER made of the creeping stems of COUCH-GRASS (*Triticum repens*, L.), a most troublesome agricultural weed.

No. 44. Copy of an etching, executed with SMUT of Wheat, a minute parasitical fungus (*Uredo*) having microscopic black spores. Most frequent on Barley and Oats.

Specimens of WHEAT (continued) and RYE (*Secale cereale*, L.).

No. 45. Various sorts of MACCARONI and VERMICELLI. Manufactured from fine Wheat-flour in Italy and Sicily. From Prof. Parlatore. 26, 27, 28.

No. 46. PAPERS manufactured from STRAW.

No. 47. OILS extracted from WHEAT, used in flavouring confectionery, etc.

No. 48. Flour buried in Kotzebue's Sound, by Captain Beechey, in 1824; quite good when dug up in 1849, by Captain Kellett.

Specimens of Straw Veneering from Japan, and of STRAW-PLAIT from North Italy, Dunstable, St. Alban's, etc., with instrument used in splitting straws. Also plait of Rye-straw. 29.

Varieties of BARLEY (*Hordeum vulgare*, L.). One of the cultivated plants of Egypt and Palestine. Torrefied grains of 30, 31

CASE

30, 31. Barley are stated to have been found in the Egyptian catacombs, though possibly of another species of *Hordeum*.

CASE BARLEY (continued). Observe a series illustrative of the

32. progress of MALTING. The Barley, after having been made to germinate by warmth and moisture, is dried and its vitality destroyed. Its infusion is fermentable, and contains saccharine matter.

Charred Barley, used to colour porter.

On an upper shelf are,—

No. 49. SCOTCH or POT BARLEY, the grain deprived of the husk by a mill; and

No. 50. PEARL BARLEY, the seeds rounded and all the outer coat removed.

CASE LEMON GRASS (*Andropogon citratus*, DC., and allied species),

33. furnishing fragrant essential oils, imported from India and Ceylon, as 'Lemon Grass' and 'Citronelle' oils. [Specimens of Grass Essential Oils, accompanied by good examples, in flower, of the Grass affording them, are requested.]

Note also varieties of *Sorghum*, affording in the West of Africa and South of Europe, a useful MILLET.

The species are imperfectly understood. *S. vulgare*, Pers., *S. saccharatum*, Moench, and the Millet-yielding species, being perhaps varieties of *S. halepense*, Pers., a species abundant in a wild state in South Europe, North Africa, etc.

CASE Produce of the SUGAR-CANE (*Saccharum officinarum*, L., also

34. *S. violaceum*, Tuss., and *S. sinense*, Rxb.), originally native of Southern Asia, though never met with wild. Cultivated chiefly in India, East and West Indian Islands, and Mauritius, for the supply of our market, though extensively grown also in South America and China.

No. 51. SUGAR-CANE. The solid, jointed stems grow to a height of from six to twelve or even fifteen feet, bearing a large panicle of soft hairy flowers.

No. 52. Samples of Crystallized Sugars of commerce, obtained from the clarified juice by evaporation. The uncrystallized remainder is drained off as 'Molasses.'

The great proportion of sugar in common use is refined in the United Kingdom; the raw impure Sugar being re-dissolved, heated with bullock's blood, and filtered through animal charcoal.

Upwards of 14,200,000 cwts. of unrefined Sugar were imported into the United Kingdom in 1874.

No. 53. MEGASS, the cane after passing through the rollers of the sugar-mill for the expression of the juice. It is used as fuel.

No. 54. Samples of CANE JUICE in various stages of pre-CASE paration, purified by the action of heat and lime. 34.

No. 55. SLAG from furnaces in which the waste cane is burnt. The rind of the cane contains much silica, hence the glassy slag.

No. 56. PAPER made of refuse SUGAR-CANE.

Miscellaneous articles, chiefly made of the stems, roots, etc., CASE of various grasses—as brushes, whisks, table-mats, necklaces. 35.

ROOM NO. IV.

(Entered from the Gallery, between Cases 19 and 20.)

Contains various cloths, barks, cordage, and woods, afforded CASE by species which cannot be identified. 36, 37,

ROOM NO. V.

Lily Order (*Liliaceæ*). A large and beautiful Order, CASE embracing several groups very dissimilar in habit and geographical distribution. Familiar examples are our garden 38. Lilies, Aloes, Asparagus, and Onion.

No. 57. 'BOWSTRING HEMP,' fibre afforded by the leaves of *Sansevieria zeylanica*, Willd., an Indian plant. It is extremely tenacious and well adapted for cordage.

No. 58. SOCOTRINE ALOES (*Aloë socotrina*, Lam.).

No. 59. BARBADOES ALOES (*A. vulgaris*, Lam.).

No. 60. CAPE ALOES (*A. ferox*, L., and allies).

The inspissated juice flowing from the fresh-cut leaves of these species of *Aloë*, constitutes the finest commercial ALOES. Inferior sorts are obtained by pressure or boiling the leaves. Barbadoes Aloes is imported from the West Indies in gourds.

No. 61. SQUILL, the bulb of *Scilla maritima*, L., growing on the shores of the Mediterranean.

No. 62. DRAGON'S BLOOD. The concrete resinous juice of *Dracæna Draco*, L., a tree of the Canaries. [This is not the Dragon's Blood of commerce, which is obtained from species of *Calamus*, of the 'Palm Order.' Case 87.]

NEW ZEALAND FLAX, obtained from the leaves of *Phormium* CASE *tenax*, Forst., and probably an allied species, native of New 39. Zealand and Norfolk Island. Specimens of the fibre, with cordage, baskets, garments, etc., manufactured of it. Continued in the next case.

CASE 40.

On the lower shelf.

No. 63. GRASS-WRACK (*Zostera marina*, L.), belonging to a small group of grass-like marine plants. It is common on the British coast and in most parts of the world, near low-water mark. Used for packing and to stuff beds.

CASE **Screw-Pine Order** (*Pandanaeae*). A small group of
 41. Palm-like trees and shrubs, growing mainly in the Indian islands. Remarkable for their branching candelabrum-like stems, and the roots given off from the trunk far above the surface of the ground.

No. 64. Strips of the leaves of *Carludovica palmata*, R.P., growing in New Granada.

No. 65. PANAMA HAT, of the same material.

Note—Matting made from the leaves of species of Screw-Pine (*Pandanus*) and *Frecycinetia*.

The 'Mats' in which Mauritius Sugar is imported, are made of the leaves of *P. utilis*, Borr.

CASE **FRUITS OF SCREW-PINES**, portions of stems, etc., with the sup-
 42. porting 'adventitious' roots.

CASE **Rush Order** (*Juncaceae*). Represented by the Rush of
 43. our commons and fens.

Note—Brooms and matting of the halms of common British species of Rush (*Juncus glaucus*, Ehr., and *J. communis*, Mey.).

No. 66. PITH OF SOFT RUSH (*J. communis*, Mey.), as brought to market in Norwich. Used as wick in 'rush-lights.'

Observe also, Hat, baskets, etc., made of the fibrous leaves of the PALMITE (*Prionium Palmita*, E.M.), from South Africa.

CASE **Bulrush Order** (*Typhaceae*). A group of marsh plants,
 44, 46. with long narrow leaves, and spiked or clustered flowers.

No. 67. Cakes made of the pollen of *Typha elephantina*, Rxb., India.

No. 68. Same, of the pollen of *T. angustifolia*, L., eaten in Scinde.

Under the 'Arum Order' (*Araceae*), represented in Britain by the 'Cuckoo-pint,'—

No. 69. SWEET FLAG (*Acorus Calamus*, L.), a widely distributed marsh plant, growing in Europe, Asia, and America. The creeping root (rhizome) is warm and aromatic.

No. 70. PORTLAND ARROWROOT. Starch washed from the tubers of the Cuckoo-pint (*Arum maculatum*, L.) in Portland Island. Used as Arrow-root.

No. 71 COCO-MEAL and biscuits, prepared from the starchy tubers of *Colocasia esculenta*, Scht., in the West Indies.

CASE **Sedge Order** (*Cyperaceae*). A large tribe of grass-like
 47. plants, with solid though slender stems, and the sheaths of the leaves not split in front as in grasses. Growing in every country; some of the species are widely distributed.

Observe hassocks, mats, brushes, etc., made of the wiry stems and leaves of species of SEDGE (*Carex*).

No. 72. PAPHYRUS documents from Egyptian tombs ; the CASE cellular pith of a species of Papyrus now extinct, or nearly so, 47. in Egypt.

No. 73. PAPHYRUS from the stem of *Cyperus Papyrus*, L., (*Papyrus antiquorum*, Willd. *Cyperus syriacus*, Parl.), growing in Sicily and Palestine.

Baskets, hassocks, bottle-covers, bee-hive, etc., made of the CASE MARSH GLADDEN (*Scirpus lacustris*, L.), common in Britain, and 48. generally in the north temperate zone, in watery places.

Case 45 contains a COAT of the same from Portugal.

In the Table-Cases are contained miscellaneous specimens of Fibres, Oils, Fruits, etc., which cannot be referred with certainty to their respective Orders. The closed drawers in this Room, also in rooms No. I., VI., and VIII. contain fruits and seeds scientifically arranged for reference.

GROUND FLOOR.

ROOM No. VI.

The Palm Order (*Palmaceæ*).

Palms are almost exclusively tropical, few species extending into cool countries. But one (*Chamærops humilis*, L.) reaches the South of Spain and Italy. They furnish the daily food, habitations, and utensils, of a large proportion of the human race. The order is well represented by the trees cultivated in the Palm-stove of the Royal Gardens, where many of the more important species may be found.

Cases 49, 50, 51 and part of 52 are devoted to sections of CASE the wood, flower-branches, and sheaths (*spadices* and *spathes*) 49. and leaves of Palms ; with baskets, hats, etc., made of the leaves of undetermined species.

Observe in Case 50—

JURUPARIS, a sort of trumpet used on certain festal occasions CASE by the Indians of the Rio Negro. Made of the stem of the 50. PAXIUBA PALM (*Iriartea exorrhiza*, Mt.).

The lower part of case 52, contains spadices, fruits, and CASE articles made from the leaves of *Astrocaryum* spp. 52.

Cases 53, 54 and 55 contain spadices, stems, etc., of species of *Bactris*, *Licuala*, *Plectocomia*, *Thrinax*, *Calamus* etc.

Ornamented leaf of PALMYRA PALM (*Borassus flabelliformis*, CASE L.). 56.

Spadices, fruits and mats made of leaves of *Mauritia* spp. CASE 57.

- CASE No. 74.** Hammocks of *Mauritia* thread, Brazil.
 58, 59. Plaited-work of the leaves of a *Chamærops*? from Cuba, etc.
 Matting and plait of the leaves of the South European FAN-PALM (*Chamærops humilis*, L.), growing near the Mediterranean shores.
No. 75. Great-coat of the leaves of *Chamærops excelsa*, Thb.
No. 76. Another made of the fibre of the same: both from China.
CASE Spadices of *Acrocomia*, *Enocarpus*, etc.
 60. The Table-Case contains Varnishes, 'Tar,' Paraffine, etc., manufactured from Peat and Coal; preparations of Irish Peat, compressed and fibrous; Lignites; a few fossilized stems, etc.

Room No. VII.

- CASE** In Case 61 note the enormous fruit-branch of *Raphia Ruffia*, 61, 62. Mart., from Mauritius.
CASE No. 77. TENT-COVER, 23 feet by 6, of the leaves of the FAN or TALIPOT PALM (*Corypha umbraculifera*, L.) used in Ceylon; 63. light, strong, and waterproof. The dried leaves commonly serve as umbrellas.
CASE Cases 64 and 65 contain shields, etc., made of Palm leaves.
 64, 65. In glazed case on the floor, observe a specimen of the BALSAM-BOG, of the Falklands (*Bolax glebaria*, Com.), [Museum No. I., see Case 45;]—
CASE Large Australian members of the Lily Order.
 66, 67. Species of GRASS-GUM-TREE (*Xanthorrhæa*).

Room No. VIII.

The Wall-Cases are occupied by specimens and products of the 'Palm Order.'

- CASE** COCOA-NUT PALM (*Cocos nucifera*, L.). Cultivated abundantly on the coast of tropical countries, seldom penetrating far inland. Believed to have spread originally from the west coast of Central America and adjacent islands. One of the most valuable species of the Order.
No. 78. Fruit, dry and in fluid, of the COCOA-NUT.
No. 79. HUSK of COCOA-NUT, consisting of strong wiry fibre, the 'Coir' of commerce.
No. 80. Brushes, Mats, Cordage, etc., of COIR-FIBRE.
No. 81. Ornamental articles and utensils of carved COCOA-NUT SHELL.

No. 82. ARRACK, distilled from the juice, or 'toddy,' obtained from incisions in the flowering branch, with vinegar prepared from it. CASE 70.

No. 83. OIL, also STEARINE and OLEINE, of the COCOA-NUT. Used in the manufacture of soap and candles. The oil is procured from the kernel by boiling or steaming, and pressure. One quart is said to be afforded by seven or eight nuts. 137,374 cwts. were imported in 1874.

No. 84. Model in wax, showing the GERMINATION of the COCOA PALM. The minute embryo occupies a small cavity in the firm, white albumen, or kernel, of the nut.

No. 85. Section of the STEM of COCOA-NUT PALM, furnishing *Porcupine-wood*.

OIL-PALM (*Elaeis guineensis*, L.) of Western Africa.

CASE

No. 86. Fruit-clusters of *Elaeis*, from which 'Palm-Oil' is obtained by boiling in water. Specimens of 'Palm-Oil, and its important manufactured products are exhibited. 1,045,143 cwts. of 'Palm-Oil' were imported in 1874. A selection of beads used in exchange for the oil with the natives of South and West Africa is exhibited on the bottom shelf of case 72.

SEYCHELLE PALM (*Lodoicea Seychellarum*, Lab.). Remarkable from the form of its fruit. The 'Double Cocoa-Nuts,' which prior to the discovery of the Seychelles (near Madagascar) were occasionally found floating in the Indian Ocean, from the mystery attached to their origin were highly prized, and enormous sums were paid for them. CASE 71, 72.

No. 87. Section of 'DOUBLE COCOA-NUT,' and

No. 88. Germinating fruit of same.

No. 89. Wax obtained by scraping the trunk of the Wax-Palm of the Andes (*Ceroxylon andicola*, H. B.). One tree is said to afford about 25 lbs. It is used with tallow in making candles.

Leaves and plaited-work of the CARNAUBA PALM of Brazil (*Copernicia cerifera*, Mt.).

No. 90. Stems of *Copernicia*, showing the spirally-arranged leaf-scars. From the inside of the trunk the Brazilians prepare a 'farinha.'

No. 91. Wax obtained from the surface of the young leaves.

No. 92. Cap and Belt of very fine plait of the split leaves of the Australian Cabbage Palm (*Corypha australis*, R. Br.) CASE 75.

In Case 76 observe Mats and other articles made of the leaves of *Corypha* sp. CASE 76.

Plaited-work of the leaves of *Phoenix*, chiefly from central and Southern Africa. CASE 77.

CASE DATE-PALM (*Phoenix dactylifera*, L.). Invaluable to the desert tribes of Northern Africa and the Sahara, whose most important wants it supplies. The fruit is the common food of themselves and their cattle, while their huts and houses are chiefly constructed of Date-wood.

The culture of the Date is of great antiquity. It was emblematic of the Jewish nation. Jericho was the City of Palm-trees. Date-Palms introduced into Southern Europe, seldom or imperfectly mature their fruit. The leaves are employed in church festivals.

No. 93. Baskets made of the leaves and leaf-stalks of the DATE-PALM.

No. 94. DATES and DATE CAKE, as sold at the Monastery, Mount Sinai, to travellers.

CASE Mats, Baskets, &c., chiefly made of the leaves of *Phoenix sylvestris*, Roxb.

CASE VEGETABLE-IVORY PALM (*Phytelephas macrocarpa*, R. & P.), of 80. Central America and New Granada.

No. 95. Showing the attachment of the fruits to the prostrate stem.

No. 96. Entire matured fruits.

No. 97. IVORY-NUTS, laid open.

No. 98. Model of Temple, Chess-men, and ornaments, of VEGETABLE IVORY.

CASE Case 81, occupied chiefly by apparatus employed in collecting 81. the vinous sap of the PALMYRA PALM (*Borassus flabelliformis*, L.); when fermented, called 'Toddy.' It is boiled down, to a large extent, for 'Jaggery,' or Palm-Sugar.

Note Hindoo and Cingalese BOOKS, made of strips of leaves of the 'Palmyra' (*Borassus*) Palm, with style used to mark the characters.

CASE **No. 99.** Forked stem of the DOUM PALM (*Hyphaene thebaica*, 82. Mt.), of Egypt. Exceptional in the Palm Order from its branching trunk.

No. 100. Fruits of *Hyphaene*. The thick rind in colour and taste resembles Gingerbread, hence a common name of this Palm, 'Gingerbread-tree.'

Observe the huge sheaths (spathes) which enclose the flowering branches of *Maximiliana regia*, Mt., a Brazilian Palm; used by the Indians as baskets.

CASE **No. 101.** Prickly roots thrown out from the stem above 83. the surface of the ground, by the 'Zanona Palm' (*Socratea*, sp.), in Panama; used to grate the pulp of the Cocoa-Nut.

No. 102. BETEL NUTS, the fruit of *Areca Catechu*, L. In CASE the Indian islands and China used in enormous quantities to 84. chew with lime and the leaves of species of Pepper. The Nuts are astringent, and a decoction is used in dyeing.

WINE PALM (*Caryota urens*, L.), affording in India 'Toddy' and Sugar. [See plant under dome of Palm-stove.]

No. 103. Hammock made of thread obtained from the CASE young leaves of the TUCUM PALM (*Astrocaryum vulgare*, Mt.), in 85. Brazil. Ornamented with feathers.

The upper part of this Case contains cloth of twisted thread CASE made from the leaves of the RUFFIA PALM (*Raphia Ruffia*, Mt.), 86. by the Malagasy. Garments in common use in Madagascar are of this cloth.

Note the beautifully imbricated scales of the fruits of *Raphia* spp.

SAGO PALMS (*Sagus Rumphii*, Willd., *S. laevis*, Rph., etc.). Sago is obtained from the cellular central portion of the trunk, the tree being felled, cut into lengths, and split. Ordinary sago is the starch thus procured, mixed with water and granulated. It is finally prepared at Singapore and Malacca.

No. 104. SAGO CAKES, a staple article of food in the Moluccas. Sold at about 10s. per thousand.

Observe over fireplace Case containing specimens of machine wood carving.

No. 105. DRAGON'S BLOOD, a resin obtained from the fruits CASE 87. of *Calamus Draco*, Willd., and allied species. Chiefly employed to colour varnishes, etc. [Specimens, in fruit and leaf, of resin-producing Palms are much wanted, along with the product.] CASE

'CANES' and 'RATTANS,' the long flexible stems of species of 88, 89. *Calamus*, imported for caning chairs, broom-making, etc. CASE

No. 106. COQUILLA NUTS, the fruit of the PIASSABA PALM 90. (*Attalea funifera*, Mt.), of Brazil, Venezuela, etc. Used in turnery-work. They are very hard, and take a high polish.

No. 107. PIASSABA FIBRE, from the leaf-stalks of *Attalea funifera*, Mt., and *Leopoldinia Piassaba*, Wallace. Used for cordage, street-brooms, etc.

ACOTYLEDONS.

The Table-Cases are devoted to CRYPTOGRAMS, or ACOTYLEDONS, plants which do not bear manifest flowers, nor produce seeds containing an embryo, as do the great Classes of DICOTYLEDONS and MONOCOTYLEDONS.

Acotyledons furnish comparatively few economic products; further investigation very probably may increase the number

of these. The name of the Order represented in each Case is shown on a label attached under the glass.

Fern Order (*Filices*). Chiefly specimens of Trunks of Tree-Ferns, and sections showing their internal structure. But very few species are applied to economic uses. From the rhizomes of some species, as the common Brake (*Pteris aquilina*, L.), a farinaceous food is obtained in times of scarcity. One or two species (the Male Shield-Fern, etc.) are employed in medicine as anthelmintics.

Under the allied 'HORSE-TAIL' and 'CLUB-MOSS' Orders, observe—

No. 108. Door-mats of CLUB-MOSS (*Lycopodium*), from Sweden.

No. 109. DUTCH RUSHES (*Equisetum hyemale*, L.), used for scouring and polishing. Their roughness is due to a deposit of siliceous particles in the epidermis.

Under the 'Moss Order,' note,—

No. 110. BOG-MOSS (*Sphagnum*), excellently adapted to pack living plants in for carriage, from its retention of water, like a sponge. Used in Lapland to swathe children. It contributes largely to the formation of peat.

No. 111. HASSOCKS, made in the North of England, of the Hair-Moss (*Polytrichum*), with basket and broom of the same.

Lichen Order (*Lichenes*).

No. 112. Specimens of ORCHIL, CUDBEAR, and LITMUS, prepared from species of *Roccella*, *Lecanora*, etc., used to dye shades of purple-red, or 'mauve.' These dyes may be obtained from the same species by different modes of treatment. Litmus is valuable as a test for the presence of acids, which change its purple to a red.

No. 113. LICHEN-BREAD, used in Finland in time of scarcity.

No. 114. ICELAND MOSS (*Cetraria islandica*, Ach.). Chemically allied to Starch. It swells in water; and, when boiled, gelatinizes on cooling. Used by invalids.

No. 115. REINDEER-MOSS (*Cladonia rangiferina*, Hoff.), the winter food of that animal.

Mushroom Order (*Fungi*), of which the *Mushroom*, *Puff-ball*, and 'Mould' are examples.

Observe specimens of 'Amadou,' or German tinder, prepared from *Polyporus fomentarius*, Fr., parasitical on the Oak, Birch, etc.

'Amadou' is prepared by beating thin slices of the fungus, and soaking them in solution of Nitre. 'Black Amadou' is impregnated with gunpowder.

No. 116. MORELLS (*Morchella esculenta*, L.), used in ragoûts and other dishes.

No. 117. NATIVE BREAD of Australia (*Mylitta australis*, Berk.), used by the Aborigines.

No. 118. TRUFFLES (*Tuber cibarium*, Sibth.), found, by the aid of dogs, a few inches below the surface of the ground in various parts of England, and on the Continent. The London supply is chiefly from Kent, Wilts, and Hants.

No. 119. Wood stained green by *Periza ceruginosa*, Fr., used in Tunbridge-ware and fancy work.

Seaweed Order (*Algæ*). Including also very numerous species from fresh water and moist surfaces. Some exhibit an extreme simplicity of structure, consisting of single microscopic cells, as the RED SNOWS (*Palmella nivalis* and others), which in Arctic and Alpine countries sometimes appear in quantity. The substance of several marine species is chemically similar to Starch, and, like it, swells in boiling water.

The 'Lavers' (*Porphyra*, *Ulva*, *Plocaria*, and others), are esculent.

No. 120. 'LAMINARIAN HORN,' prepared from *Laminaria buccinalis*, Ag., of the Cape of Good Hope.

No. 121. *Durvillaea utilis*, Bory, a gigantic seaweed of the Southern Ocean. Said to be used in Chili for food, made into soup, etc.

No. 122. Portion of stem, etc., of *Macrocystis pyrifera*, Agh., an enormous seaweed, abounding in the Antarctic Ocean, between the parallels of 40° and 64°. Specimens from 100 to 200 feet in length are common: they sometimes occur from 500 to perhaps 1000 feet.

No. 123. IRISH MOSS, or CARRAGEEN (*Chondrus crispus*, Lngb., and *C. mammillosus*, Grev), imported from the West of Ireland for cattle-feeding and dietetic purposes.

No. 124. GULF-WEED (*Sargassum bacciferum*, Agh.), found in enormous quantity, floating in an eddy of the Atlantic, to the west of the Azores, from 20° to 36° north latitude, and again west of the Bahamas.

No. 125. KELP, the ash of the common SEA-WRACK (*Fucus vesiculosus*, L., with other species) burnt in the open air. Contains from 5 to 8·5 per cent. of Carbonate of Soda.

No. 126. IODINE, obtained from various species of *Fucus* (*F. vesiculosus*, L., *F. nodosus*, L., etc.).

Round the Gallery railing of this Room observe two stems of a species of *Calamus*, an East Indian Palm, one measuring 369 feet in length, and the other 160 feet.

In one of the window-recesses observe the 'VINEGAR-PLANT,' floating upon syrup, in which it induces fermentation. It is a 'Mould,' the spawn (mycelium) of which forms a tough web.

ROOM No. IX.

The passage leading to the east door, between the Cases No. 91 and 93, contains stems of Tree-Ferns, natives of the islands of the Southern Hemisphere, India, etc., where, especially in New Zealand and Norfolk Island, they become a prominent feature in the landscape.

ROOM No. X.

Specimens of a miscellaneous character, which cannot be identified with their respective species, and other objects which do not admit of systematic classification, are here exhibited.

ASE Cases 97, 98, and 99 contain sections of stems, showing the '98, injury done to the wood by insects, bad pruning, etc.

100. Series illustrating the preparation of various perfumes.

ASE In Cases 101 and 102 are exhibited several Robes or Dresses 11-2. from Tahiti, made of Tapa cloth (*Broussonetia papyrifera*, Vent.), and ornamented with other vegetable tissues. Presented by H.R.H. The Duke of Edinburgh. For other specimens of Tapa Cloth, see Case 83, Museum I.

ASE Nests of Wasps, constructed by these insects, of masticated 03. wood.

ASE Specimens of Paper and materials used in Paper-making.

04. (Samples of Paper made of the fibre of various species, are exhibited, in their classified collections, under the Natural Orders to which they belong.)

ASE Cases 105, 106, and 107 contain specimens illustrating vegetable morphology and pathology.

The Table-Cases contain a very miscellaneous collection of objects, which cannot be referred to their proper places in the arranged series, also a small collection of fossil woods.

Over the fireplace is a case of specimens of the Silkworm of the *Ailanthus* (*Bombyx Cynthia*), of China; now introduced extensively into Western Europe and Algeria.

Note in one of the window-recesses a case of Lichens and Pine-wood, brought from the Arctic regions by exploring expeditions.

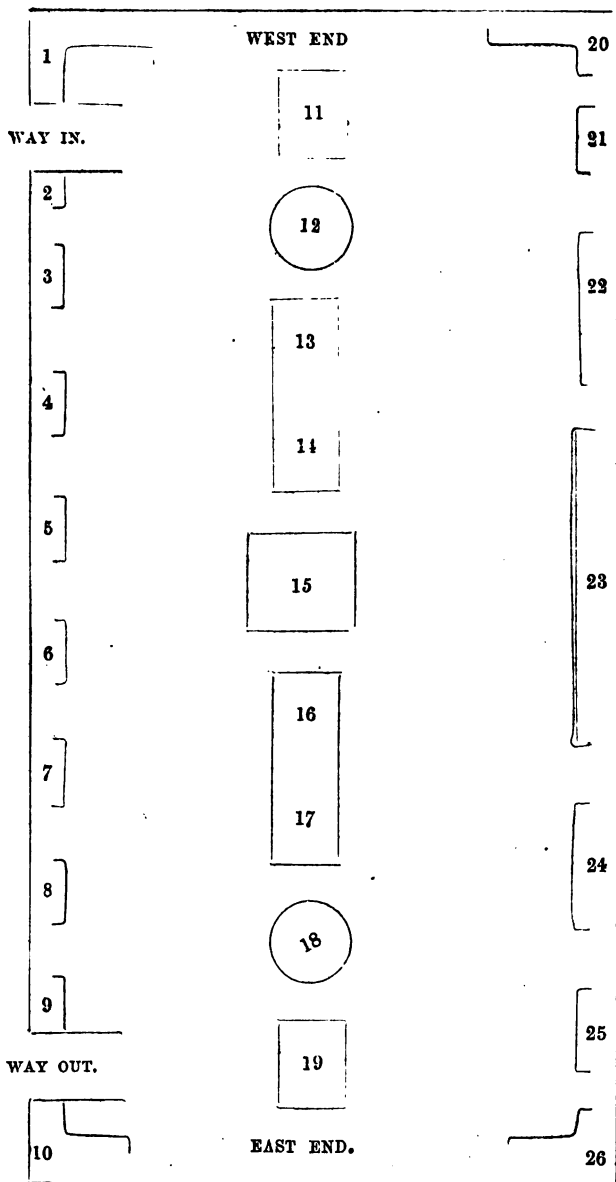
MUSEUM No. III.

This Museum is devoted chiefly to specimens of Colonial Timber, most of which were obtained from the several International Exhibitions. The collection is arranged in groups according to the countries producing them, and not with any attempt at scientific classification, as in the other Museums. It must be borne in mind, however, that most of the specimens here exhibited are duplicates of those contained in the arranged collections, where they are necessarily small to suit the shelves of the Cabinets. Here, their full diameter is shown, and the magnitude of many of our Colonial trees become the more striking.

The old Orangery has been devoted to these collections, and the annexed Plan of the House will serve to direct visitors to the more important specimens which it contains.

1. Trinidad and British Guiana.
2. British Guiana.
3. Ditto, ditto.
4. Ditto, ditto. Note also a fine plank of *Cedrus atlantica*, Man.
5. Plank of Deodara (*Cedrus deodara*, Roxb.), and tall stems of Tree Ferns.
6. Ditto, ditto.
7. Large slab of Camphor wood (*Cinnamomum Camphora*, Nees et Eb.), and portion of a branch of Dragon Tree of Teneriffe.
8. Canada, etc.
9. Canada. Observe a fine slab of the White Pine (*Pinus strobus*, L.)
10. Victoria.
11. East and West Indies and Algeria. Also a case of Vegetable Resinous Products, from Messrs. Wallis, Long Acre.
12. A set of diagrams, illustrating the natural orders of the vegetable kingdom. Prepared by Prof. Oliver, for the Science and Art Department, South Kensington.
- 13 and 14. A relic of 'Herne's Oak,' blown down in Windsor Forest, August 31, 1863. Presented by Her Majesty the Queen. Also a Collection of Woods from Tuscany. A series of British-grown Woods. And an interesting series illustrating the manufacture of children's toys as carried on in Saxony. It will be seen that the rough design of the toy required is first turned in a circular piece of wood by the lathe; sections are then cut out and finished by hand.
15. Tasmanian Timber Trophy.

PLAN OF MUSEUM No. III.



16 and 17. Ceylon, St. Helena, Guatemala, etc. Also a specimen of Bahamas Satin Wood.

18. Canada and British Columbia. Observe fine Sections of Canadian White Oak (*Quercus alba*, L.), and of the Douglas Fir (*Abies Douglassii*, Ldl.), of British Columbia. Also a magnificent Section of the Common Oak (*Quercus Robur*, L.), grown in Denmark.

19. New South Wales and Victoria.

20. Queensland.

21. New Zealand.

22. Natal. Also *Welwitschia mirabilis*, Hook. fil.

23. Tasmania.

24, 25, 26. New South Wales.

On Table No. 11 is an instructive series of sections of the Cork Oak (*Quercus Suber*, L.), showing the growth of the bark (Cork) from one to fifteen years.

On the Natal sideboard (No. 22) is a glazed case containing specimens of the peculiar *Welwitschia mirabilis*, Hook. fil. This plant, which is closely allied to the Conifers or Pine Family, was discovered by Dr. Welwitsch in 1859, on an elevated sandy plateau in south-west tropical Africa. It grows in a hard stony soil, where little or no rain falls. It has but two leaves, which exist the whole life of the plant, which is said to be 100 years. These leaves lie flat upon the ground, and are about six feet long.

Between the Tasmanian and New South Wales Collections (Nos. 23 and 24), is the base, as well as a transverse section, of a curiously-formed trunk of a tree known in Ascencion as "Lapacho." The wood is used for ship-building in the Arsenal of Ascencion.

Between Buttress 3 and 4 note large section of Cedar of Lebanon (*Cedrus Libani*, Loud.), from a tree grown in the Royal Gardens, Kew. The specimen measures 4 feet 5 inches in diameter, and was 113 years old. Adjoining this is a large washing bowl, made by native mahogany cutters, from the trunk of a single mahogany tree, in British Honduras.

Between 4 and 5 is a fine specimen of Scotch Fir (*Pinus sylvestris*, L.), from Rothiemurchus. Also some large specimens of Virgin Cork, introduced into this country for application in rustic garden work, etc. Note also, at Buttress No. 5 of Plan, some very fine stems of Bamboo adapted for fishing-rods, etc.

Between 6 and 7 observe a model, in wax, of the *Rafflesia Arnoldi*, R. Br., a gigantic parasite upon the stems of some of

the Vine Order, growing in Sumatra. The flower measures from 3 feet to 3 feet 6 inches across. The plant is destitute of stem and leaves. Models of early stages of the flower are also exhibited. [See Rhizanth Order, Museum No. 1., Case 101.]

Between 7 and 8 is a specimen of the trunk of a Bunya Bunya (*Araucaria Bidwillii*, Hk.), from Queensland; and close to this is a branch of the celebrated Dragon-tree of Orotava (*Dracæna Draco*, L.), destroyed by a gale in 1867.

Between 8 and 9 is a group of Grass Gum-trees (*Xanthorrhæa*, spp.) and *Kingia australis*, R. Br.—Plants of Australia, which, though bearing some outward resemblance to each other, belong respectively to the Lily and Rush families.

Between 17 and 18 is a case containing a most peculiar formation from the root of the Double Cocoa-Nut (*Lodoicea Seychellarum*, Lab.). The actual root in a growing state is seated in this bowl or cup, and the rootlets pass into the earth through the holes seen inside this specimen.

INDEX.

	PAGE		PAGE		PAGE
Abelmoschus esculentus...	11	Andropogon, spp.	72	Balsam-bog	35, 76
Abies Picea and A. bal-		Anonaceæ	7	Bamboos	68, 69
samea	62, 63	Anthemis nobilis	38	Bananas	67
Abies excelsa	61, 63	Antiaris toxicaria	55	Banyan	55
Abrus precatorius	25	Apocynaceæ	43	Baobab	11
Acacia Catechu and A.		Apple	29	Baphia nitida	27
Niopo	27	Aquifoliaceæ	40	Barberry Order	8
Acanthaceæ	47	Aquilaria Agallocha	51	Barley	71
Aceraceæ	16	Araceæ	74	Barosma, spp.	20
Acer campestre	17	Arachis hypogæa	24	Barringtonia Order...	32
Acer pseudo-platanus ...	16, 17	Aralia nudicaulis	35	Bassia butyracea	41
Acer saccharinum	16	Araliaceæ	35	Bast	11, 13
Acmena	32	Araucaria, spp.	62	Batatas edulis	45
Aconitum	7	Arecæ Catechu	79	Bauhinia	26
Acorus Calamus	74	Arenaria musciformis ...	10	Bedeaguars	23
Acotyledons	79	Argan Oil	41	Beans, sacred	8
Adansonia digitata	11	Argania Sideroxylon ...	41	Bedfordia salicina	39
Ægle Marmelos	13	Aristolochia	51	Beech and oil of	59
Æschynomene aspera ...	25	Arnatto	10	Beefwood Order	59
Æsculus Hippocastanum ...	16	Arrack	77	Beet and sugar of	48
African Rosewood	25	Arrowroot Order	67	Benzoin	39
African Teak	52	Arrowroot, English	46	Berberidaceæ	8
Agave americana	68	Artanthe elongata	57	Bergamot	14
Ailanthus silkworm... ..	82	Artichokes, Jerusalem ...	38	Bertholletia excelsa... ..	32
Akee	16	Artocarpeæ	55	Beta vulgaris	48
Alangium Order	30	Artocarpus incisa	55	Betel-nuts	79
Aleurites triloba	52	Artocarpus integrifolia ...	55	Betula papyracea	59
Algæ	81	Arum maculatum	74	Bhang	54
Alkanet-root	45	Arundo Donax... ..	70	Bignonia Chica	44
Allspice	31	Asclepiadaceæ	42	Bignoniaceæ	44
Almonds	29	Asl	42	Bikh or Bish	7
Aloe, spp.	73	Aspidosperma excelsum... ..	43	Bindweed Order	45
Aloe, American	68	Assafetida	54	Birch-bark	59
Aloes	73	Astragalus... ..	24	Bird-lime	41
Amadou	80	Astrocaryum vulgare	79	Birthwort Order	51
Amaryllis Order	63	Atherosperma moschata..	50	Bitter-wood	21
Ammi Visnaga... ..	34	Atropa Belladonna	46	Bixa Orellana	10
Ammoniacum, Gum	34	Attalea funifera	79	Blighia sapida	16
Amomum Melegueta	66	Aurantiacæ	13	Blimbing	19
Ampelidæ	18	Avena sativa	71	Blue gum	31
Amygdalus communis ...	29	Averrhoa Bilimbi	19	Boehmeria nivea	54
Amyridaceæ	23	Avocado Pear	49	Bogbean	43
Anacardiaceæ	22	Bael	14	Bog-moss	80
Anacardium occidentale..	22	Balanophora, spp.	64	Bog Oak	58
Anamirta Cocculus... ..	8	Balata... ..	41	Bolax glebaria	35, 76
Anastatica hierochuntica.	9	Balm of Gilead and Mecca	23	Bombax Ceiba... ..	11
Alkanna tinctoria	45	Balsam of Peru and Tolu	25	Boraginaceæ	45
Andromachia igniaria ...	38				

	PAGE		PAGE		PAGE
Borassus flabelliformis, 75, 78		Carob-pods	27	Club-Moss Order	80
Boswellia	23	Carrageen Moss	81	Coca Order	15
Boxwood	52	Carthamus tinctorius	38	Cocculus indicus	8
Brake	80	Carum Carui	35	Cochineal	34
Brassica oleracea	9	Carya, spp.	60	Coco Meal	74
Brayera anthelmintica	28	Caryocar, spp.	17	Coccol	12
Brazil-nuts	33	Caryophyllaceæ	10	Coccol-Nut Palm	76
Bread (native), Australia	81	Caryophyllus aromaticus.	31	Cocos nucifera	76
Bread-fruit Order	55	Caryota urens	79	Codilla of Flax	20
Bread (Lichens)	80	Cascarilla	36	Coffee	37
Bromeliaceæ	68	Cashew Nut	22	Coir	76
Broom	23	Cassava Meal	53	Coix lachryma	70
Broom-rape	47	Cassia buds	50	Colletia cruciata	21
Broussonetia, spp.	56, 82	Cassia, spp.	26	Colocasia esculenta	74
Brya Ebenus	25	Cassia lignea and vera	49	Colza Oil	9
Buchu	20	Castanea vesca	59	Combretaceæ	30
Buckthorn Order	21	Castile soap	42	Compositæ	38
Buckwheat Order	48	Castilleja elastica	55	Coniferæ	60
Bulrush Order	74	Castor Oil	52	Conium maculatum	35
Bunya-bunya Pine	62	Casuarinaceæ	59	Convolvulaceæ	45
Burgundy Pitch	63	Catechu	27	Convolvulus Scammonia	45
Butea frondosa	56	Cavanillesia	11	Cookia punctata	14
Butter and Tallow-tree	15	Cayenne Pepper	45	Copaiba	26
Butternut-wood	60	Cedar (New S. Wales)	17	Copaifera	26
Butter, Vegetable	41	Cedar Pencil	63	Copal	26
Butyrospermum Parkii	41	Cedar (West Indian)	17	Copernicia cerifera	77
Buxus sempervirens	52	Cedar-wood	17, 62	Cocquilla Nuts	79
Byttneriaceæ	12	Cedrela australis	17	Corchorus capsularis	12
		Cedrela odorata	17	Coriandrum sativum	35
Cabbage Walking-stick	9	Cedron	21	Cork Oak	58, 85
Cactaceæ	33	Cedrus	62	Cornel Order	36
Cactus, Old Man	34	Celastraceæ	21	Corylaceæ	57
Cæsalpinia Coriaria and		Cephaelis Ipecacuanha	37	Corypha umbraculifera	76
Sappan	26	Cerantonia Siliqua	27	Corypha australis	77
Cæsalpinieæ	23, 26	Cereals	68	Cotton	11
Caffer Tea	39	Cereus, spp.	34	Cotton (Silk)	11
Calabash	33, 44	Cerexylon andicola	77	Couroupita guianensis	32
Calabash Order	44	Cetraria islandica	80	Cowdi Resin	62
Calamander Wood	40	Chamærops	75, 76	Cow Tree (of Pará)	41
Calamum Draco	79	Chamomiles	38	Crab Oil	17
Callitris quadrivalvis	63	Chaw-stick	22	Crabs'-eyes	25
Calluna vulgaris	39	Cheirostemon platanoides	12	Cranberry Order	30
Calotropis gigantea	42	Chenopodiaceæ	45	Cranesbill Order	18
Calumba Root	8	Chestnut	59	Cream of Tartar	18
Cambogia	14	Chestnuts, Water	32	Crecentia Cujete	44
Camphor	40, 83	Chickweed Order	10	Croesus sativus	68
Camphor (Sumatra)	13	Chicory	39	Crotalaria juncea	24
Cam-wood	27	China Grass	54	Croton Oil	52
Canada Balsam	63	China Root	65	Cruciferae	9
Canary-seed	70	Chloroxylon Swietenia	17	Cryptogams	79
Canna edulis	67	Chocolate	12	Cuba Bast	11
Cannabaceæ	54	Chondrus, spp.	61	Cubeb	57
Cannabis sativa	54	Chrysobalanæ	20	Cucumis, spp.	32
Candle-nut Oil	52	Chrysophyllum Cainito	41	Cucurbita maxima	33
Candles (Balanophora)	64	Churras	54	Cucurbitaceæ	32
Canes	79	Cicer arietinum	24	Cudbear	80
Cannon-ball tree	32	Cichorium Intybus	39	Cumin	35
Caoutchouc	43, 53, 56	Cinchona	36	Cunninghamia sinensis	62
Capparidaceæ	10	Cinnamomum zeylanicum	49	Cupressus sempervirens	63
Capsicum annum	45	Cinnamon	40	Curare	43
Caraipi	29	Cistaceæ	10	Curcuma angustifolia and	
Carapa, Oil of	17	Cistus creticus	10	longa	68
Caraways	35	Citron, fingered	14	Currants	18, 34
Cardamoms	60	Citronelle Oil	72	Cuscutaceæ	45
Carex	74	Cladonia rangiferina	60	Custard Apple	7
Carica Papaya	33	Clematis vitalba	7	Cutch	27
Carludovica palmata	74	Clover Seed	24	Cycadaceæ	63
Carnauba Palm	77	Cloves	31	Cydonia vulgaris	20

	PAGE		PAGE		PAGE
<i>Cynosurus cristatus</i> ...	71	Everlasting ...	38	Gum Ammoniacum ...	34
Cyperaceæ ...	74	Exchequer tallies ...	57	Gum Arabic ...	27
Cypress ...	63	Exogonium Furga ...	45	Gum, British ...	46
Citharexylon ...	47			Gum Trees ...	31
		Fagus... ..	59	Gunja... ..	54
Dacrydium Franklinii ...	60	Fatsia papyrifera ...	35	Gunny ...	12
Dalbergia ...	25	Fennel Order ...	34	Gutta Percha ...	41
Dammara ...	62	Fern Order ...	80	Guttiferae ...	14
Dandelion ...	39	Ferula galbaniflua ...	34	Gynerium saccharoides ...	71
Daphne papyracea ...	51	Fescues ...	71		
Date Palm ...	78	Ficoideæ ...	33	Hæmatoxylon Campechi-	
Datura Stramonium ...	46	Ficus ...	55, 56	anum ...	28
Dicotyledons ...	6	Fiddle-wood ...	47	Hair Moss... ..	80
Digitalis purpurea ...	47	Fig-Marigold Order ...	33	Haloragææ ...	32
Dioscoreaceæ ...	65	Fig Order ...	55	Hand Plant ...	12
Diospyros Ebenum and		Figwort Order ...	47	Harpulia pendula ...	16
<i>quassita</i> ...	40	Filices ...	80	Hashish or Hachich ...	54
Dipsacææ ...	37	Flacourtiaceæ ...	10	Hawthorn ...	29
Dipterocarpeæ ...	13	Flax ...	19, 20	Hazel Order ...	57
Dipteryx odorata ...	25	Flax, N. Zealand ...	73	Heath Order ...	39
Divi-divi ...	26	Flindersia Oxleyana		Hedra Helix ...	35
Dock ...	48	Forbidden Fruit ...	14	Helianthus tuberosus ...	38
Dodder Order ...	45	Foxglove ...	47	Helichrysum, spp. ...	38, 39
Dogbane Order ...	43	Frankincense ...	63	Hemidesmus indicus ...	43
Dog's-tail grass ...	71	Fraxinus, spp. ...	42	Hemlock ...	35
Dogwood of Tasmania ...	39	Frenela rhomboidea ...	63	Hemlock Spruce ...	61
Dorema ammoniacum ...	34	Freycinetia ...	74	Hemp ...	54
Double Cocoa-nut ...	77, 86	Frogbits ...	65	Henbane ...	46
Douglas Pine ...	61, 85	Fucus, spp. ...	81	Henna ...	30
Doum Palm ...	78	Fungi... ..	80	Hermas gigantea ...	35
Dracena Draco ...	69, 73, 86	Fustic... ..	56	Herne's Oak ...	58, 83
Dragon's Blood ...	69, 73			Hevea brasiliensis ...	53
Dragon Tree ...	69, 86	Galbanum Gum ...	34	Hickory Nuts ...	60
Drupaceæ ...	28	Gall-nuts ...	58	Hog-gum ...	15
Dryobalanops aromatica... ..	13	Gambier ...	37	Holly ...	40
Duguetia ...	7	Gamboge ...	14	Honeysuckle ...	38
Durian ...	12	Garancine ...	37	Hops ...	54
Durvillea utilis ...	81	Garcinia ...	14	Hordeum vulgare ...	71
Dutch Rushes ...	80	Genista scoparia ...	24	Horse-chestnut ...	16
		Gentianææ... ..	43	Horse-radish ...	7
Eagle Wood ...	51	Geraniaceæ ...	18	Horse-tails... ..	80
Ebenaceæ ...	40	Gero ...	70	Huon Pine... ..	44, 60
Ebony ...	40	Gingelely Oil ...	44	Hura crepitans ...	52
Ebony (West Indian) ...	25	Ginger ...	36	Hymenæa Courbaril ...	27
Edgeworthia Gardneri ...	51	Ginseng ...	68	Hyoscyamus niger ...	46
Elæagnaceæ ...	50	Girardinia heterophylla... ..	54	Hypericaceæ ...	14
Elæagnus orientalis ...	50	Glastonbury Thorn... ..	29	Hyphæne thebaica ...	78
Elais guineensis ...	77	Glycyrrhiza ...	24		
Elettaria ...	66	Gnetum ...	60	Iceland Moss ...	80
Elm Order ...	58	Gooseberry ...	34	Ilex Aquifolium ...	40
Elodea canadensis ...	65	Gossypium, spp. ...	11	Ilex paraguayensis ...	40
Encephalartos, spp. ...	63	Gouania domingensis ...	22	India-rubber ...	53
Ensete ...	67	Gourds ...	32, 33	Indian Corn ...	70
Entada scandens ...	27	Grains of Paradise ...	66	Indigo ...	24
Epacridaceæ ...	39	Gram ...	24	Insect Wax ...	42
Episætetum hyemale... ..	80	Gramineæ... ..	68	Iodine... ..	81
Ericaceæ ...	39	Grape Vine ...	18	Ipecacuanha ...	37
Eriobotrya ...	29	Grapple Plant ...	44	Iriarteæ exorrhiza ...	75
Ervum Lens ...	24	Grass Gum Tree ...	76, 86	Iris Order ...	68
Erythroxylaceæ ...	15	Grass-wrack ...	73	Irish Moss... ..	81
Esparto Grass ...	69	Greenheart ...	45	Iron-bark Trees ...	31
Eucalyptus ...	31	Ground Nuts ...	24	Isatis tinctoria ...	9
Euconymus europæus ...	21	Guaco ...	49	Isonandra Gutta ...	41
Euphorbiaceæ ...	51	Guaiacum officinale ...	20	Ivy ...	35
Euphoria Longana... ..	16	Guarana Bread ...	18		
Euryangium Sumbul ...	35	Guavas ...	31	Jack fruit ...	55
Eurybia argophylla ...	39	Guilandina Bonduc... ..	26	Jaggery ...	78
Evening Primrose Order..	32	Gulf Weed ...	81	Jalap ...	45

	PAGE		PAGE		PAGE
Jambosa vulgaris ...	31	Lodoicea Seychellarum ...	77, 86	Monocotyledons ...	64
Japan Pepper ...	20	Loganiaceæ ...	43	Monsonia ...	18
Japan Wax ...	22	Logwood ...	26	Moquilea utilis... ..	29
Jasmine Order... ..	42	Longans ...	18	Mora ...	27
Jateorhiza Calumba ...	8	Loquat ...	29	Morchella esculenta ...	81
Jatropha ...	53	Loranthaceæ ...	36	Morrells ...	81
Job's Tears ...	70	Lotos ...	21, 22	Moronobæa coccinea ...	15
Joint Firs ...	60	Lotus, sacred ...	8	Morus, spp ...	56
Juglandaceæ ...	59	Luffa ægyptiaca ...	32	Mosses ...	80
Juglans ...	59, 60	Lycopersicum esculentum ...	45	Mould ...	80
Jujube ...	21	Lycopodium ...	80	Mucuna ...	25
Juncaceæ ...	74	Lythraceæ ...	29	Mulberries ...	56
Juniper Berries ...	63			Munjeet ...	37
Jute... ..	12			Musaceæ ...	67
		Maccaroni ...	71	Mushroom Order ...	80
Kamala Dye ...	52	Mace ...	50	Musk-root ...	35
Kauri Resin ...	62	Maclura tinctoria ...	69	Musk-wood (Tasmania)... ..	39
Kava-root ...	57	Macrochloa tenacissima... ..	56	Mustard ...	9
Kelp ...	81	Macrocytis pyrifera ...	81	Mustard-tree ...	42
Kigelia, spp. ...	45	Madder ...	37	Myrica Order ...	57
Kingia australis ...	86	Magnolia Order ...	7	Myristicaceæ ...	50
Kino ...	25	Mahogany... ..	17	Myrobalans ...	30
Kola Nuts... ..	12	Maize ...	70	Myrospermum Pereiræ ...	25
Kousso ...	28	Mallotus Phillipinensis ...	62	Myrrh ...	23
		Mallow Order ...	10	Myrtaceæ ...	30
Labdanum... ..	10	Malpighiaceæ ...	15	Myrtle ...	30
Labiataæ ...	47	Malt ...	72	Myrtle (Tasmanian) ...	59
Lac ...	56	Malvaceæ... ..	10	Myrtus Pimenta ...	31
Lacc-bark Order ...	50	Mammee Apple ...	15		
Lagenaria vulgaris ...	33	Mandiocca Meal ...	53	Napoleona Order ...	33
Lagetta lintearia ...	51	Mangifera indica ...	22	Nardostachys Jatamansi ...	37
Laminaria ...	81	Mango ...	22	Narthex asafetida ...	34
Lancewood ...	7	Mangold Wurzel ...	48	Nasturtium ...	18
Landolphia florida ...	43	Mangosteen ...	14	Nectandra Rodiei ...	49
Langsdorfia hypogæa ...	64	Mangrove ...	30	Negro Peach ...	37
Lapacho ...	85	Manihot, spp ...	53	Nelumbiaceæ ...	8
Larch ...	61	Manila Hemp ...	67	Nelumbium speciosum ...	8
Lauraceæ ...	49	Manna ...	42	Nepentheaceæ ...	53
Lavender ...	47	Maoutia Puya ...	54	Neroli... ..	14
Laver ...	81	Maple Order ...	16	Nettle ...	54
Lawsonia inermis ...	30	Maram Grass ...	70	Newton's process for de-	
Lecanora ...	80	Maranta arundinacea ...	67	siccating wood ...	70
Lecythydaceæ ...	32	Marantaceæ ...	67	New Zealand Flax ...	73
Lecythis, spp ...	32	Marjoram ...	47	Nicotiana, spp ...	46
Leguminosæ ...	23	Marking Nuts... ..	22	Nightshade Order ...	45
Lemon Grass, and Oils of	72	Mastic ...	22	Niopé Snuff ...	27
Lentils ...	24	Maté ...	40	Norfolk Island Pine ...	62
Leopard-wood ...	55	Matico ...	57	Norway Spruce ...	61
Leopoldinia Piassaba ...	79	Matricaria Chamomilla... ..	38	Nutmegs ...	50
Lepurandra saccidora ...	55	Mauritia ...	75, 76	Nuts and Nut Order ...	57, 59
Letter-wood ...	55	Maximiliana regia ...	73	Nux-vomica ...	43
Leucadendron argenteum ...	50	Medlar ...	28	Nymphæaceæ ...	8
Lichen-bread ...	80	Megass ...	72		
Lichenes ...	80	Melaleuca, spp ...	31	Oak ...	58
Lign Aloes ...	57	Melastomaceæ ...	30	Oat ...	71
Lignum Vitæ ...	20	Meliaceæ ...	17	Ochro... ..	10
Liliaceæ ...	73	Menispermaceæ ...	7	Ochroma Lagopus ...	11
Lime ...	12	Menyanthes trifoliata ...	43	Oil-cake (Cotton-seed) ...	11
Linacææ ...	19	Mesembryanthemum ...	33	Oil-cake (Linseed)... ..	19
Linden ...	12	Mespilus ...	29	Oil-Palm ...	77
Linen-cloth ...	19	Mezereon ...	51	Oils from Wheat ...	71
Linseed ...	19	Milk-tree (of Pará)... ..	41	Oldfieldia africana ...	62
Linum usitatissimum ...	19	Milkwort Order ...	10	Olea europæa ...	42
Liquidambar orientale ...	34	Millet ...	70, 72	Oleaceæ ...	42
Liquorice ...	24	Mimoseæ ...	23, 27	Oleaster Order... ..	50
Litchis ...	16	Mistletoe ...	36	Olibanum ...	23
Litmus ...	80	Monkey-pot ...	32	Olive Order and Oil ...	42
Locust-tree (W. Indian) ...	27	Monkshood ...	7	Onagraceæ ...	32

	PAGE		PAGE		PAGE
Opium	8	Piassaba Palm... ..	79	Rhododendron... ..	39, 44
Opuntia Ficus-indica	34	Piassaba Fibre	79	Rhubarb	48
Orach... ..	48	Pimento	31	Rhus	15, 22
Orange	14	Pine-apple... ..	68	Rice	69
Orchideæ	65	Pine Order	60	Rice-paper	35
Orchil... ..	80	Pine-soap and wool... ..	61	Ricinus communis	52
Ordeal Beans	25	Pinus palustris... ..	62	Rocella	80
Orobanchaceæ... ..	47	Piperaceæ... ..	57	Rosaceæ	28
Oryza sativa	69	Pistacia and nuts	22	Rose-apples	31
Osage Orange	56	Pita Fibre	68	Rose of Jericho	9
Osiers... ..	57	Pitch	63	Rosewood	25
Otto of Rose	28	Pitcher-plant Order... ..	53	Rosin	63
Oyster-bay Pine	63	Pittosporaceæ	20	Rottlera tinctoria	52
Oxalate of Lime	34	Plantains	67	Rubia	37
Oxalic Acid	19, 24	Plume Nutmegs	50	Rubiaceæ	36
Oxalidæ	19	Podostemon Order	57	Rush	74
Oxandra virgata	7	Pogostemon Patchouli	47	Rushes, Dutch... ..	80
		Polygonaceæ	48	Rutaceæ	20
Paddle-wood	43	Polyporus, spp.	80	Rue	20
Paddy... ..	69	Polytrichum	80	Rye	71
Palm Oil	77	Pomaceæ	29		
Palm Sugar	78	Pomegranates	31	Saccharum, spp.	72
Palmaceæ... ..	75	Poppy... ..	8	Safflower	38
Palmeilla nivalis	81	Porcupine-wood	77	Saffron	68
Palmitæ	74	Portland Arrowroot	74	Sagapenum, Gum	35
Palmyra Palm	75, 78	Portulaca oleracea	33	Sage	47
Pampas Grass	71	Potato... ..	46	Sago	64, 79
Panama Hat	74	Pottery tree	29	Salicaceæ	57
Pandanaceæ	74	Pounce	63	Salvadora persica	43
Pangium Order	33	Primrose Order	47	Sandal-wood	51
Panicum, spp.	70	Prionium Palmita	74	Sandarach... ..	63
Papaver somniferum	8	Proteaceæ	50	Sandbox-tree	52
Papaveraceæ	8	Provence Reed... ..	70	Sander's-wood, Red	25
Papaw	33	Prunus, spp.	28	Sansevieria zeylanica	73
Paper	71	Psamma arenaria	70	Santalum album	51
Papilionaceæ	23, 24	Psidium, spp.	31	Sap-green	21
Papyrus	75	Pteris aquilina	80	Sapindaceæ	16
Paraffine	76	Pterocarpus, spp.	25	Sapodilla Order	41
Paraguay Tea	40	Puff ball	80	Sapotaceæ... ..	41
Paritium elatum	11	Pulque	68	Sappan-wood	26
Patchouli	47	Purslane	33	Sapucaia Nuts	32
Paullinia sorbilis	16	Pyrethrum roseum	38	Sarcocaulon Heritieri	18
Paxiuba Palm	75	Pyrus, spp.	29	Sargassum bacciferum	81
Pea	24			Sarraceniaceæ	8
Pear	29	Quassia Order	21	Sarsaparilla Order	65
Pearl Barley	72	Quercitron... ..	58	Sarsaparilla, Indian	43
Peat	76	Quercus	58	Sarsaparilla, Virginian	35
Pedaliaceæ	44	Quillai Bark	28	Sassafras	49
Peepul	56	Quince	29	Satin-wood	17
Pentadesma butyracea	15	Quinine	36	Saxifrages	34
Penicillaria spicata... ..	70	Quinoa	48	Scammony	45
Pennyroyal	47			Sciadopitys verticillata	62
Pepper	57	Rafflesia, spp.	64, 85	Scilla maritima	73
Pepper, Jamaica	31	Raisins	18	Scirpus lacustris	75
Pepper, Japan	20	Ranunculus Order	7	Scleroleima forsteroides	38
Peppermint	47	Raoulia eximia... ..	38	Scotch Fir	61, 85
Persea gratissima	49	Raphia Ruffia	76, 79	Screw-Pine	74
Persian Berries... ..	21	Rattans	79	Scrophulariaceæ	47
Peruvian-bark Order	36	Ravenala	67	Seaweed Order	81
Peziza æruginosa	81	Red Snow	81	Secale cereale	71
Phalaris canariensis	70	Reed	70	Sedge Order	74
Phoenix dactylifera	78	Reindeer Moss... ..	80	Senna	26
Phormium tenax	73	Revalenta	24	Sesuoia gigantea	63
Phragmites communis	70	Rhamnaceæ	21	Sesamum indicum	44
Phrynum dichotomum	67	Rhea Fibre	54	Seychelle Palm	77, 86
Physostigma venenosum... ..	25	Rhizanthææ	64	Shaddock	14
Phytelphas macrocarpa	78	Rhizobolaceæ	17	Shea Butter	41
Phytolaccaceæ... ..	48	Rhizophoraceæ	30	Shepherdia argentea	50